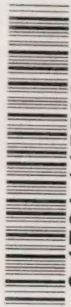


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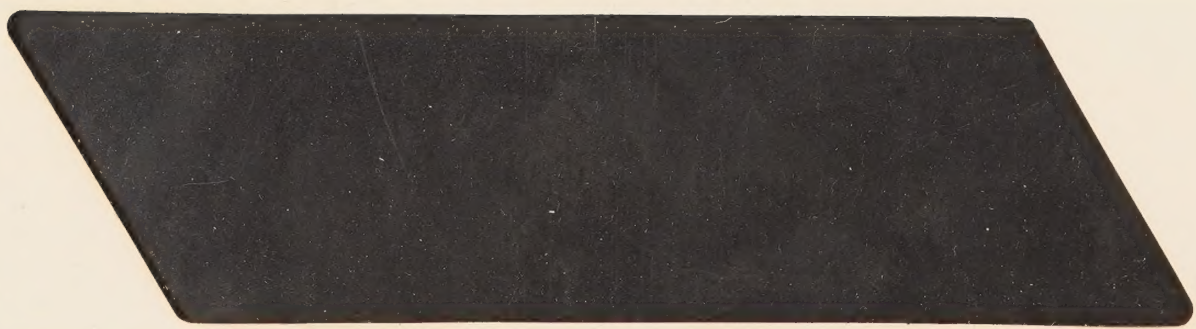


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**MID
NORTH MANITOBA**



*This program is cost shared under
the Manitoba-Northlands Agreement
between the Province of Manitoba
and the Department of Regional
Economic Expansion*



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Expansion
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RESOURCES AND ENVIRONMENT

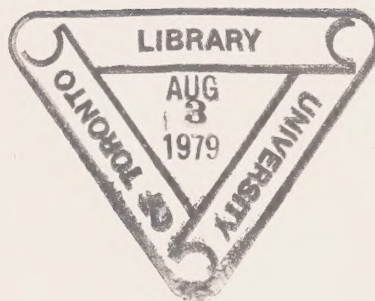


D. J. Teillet

January, 1979

A Resource Information Package for

**MID
NORTH MANITOBA**



*"Contrariwise, if it was so, it might be;
and if it were so, it would be;
and if it isn't, it ain't.
That's logic."*

*Lewis Carroll
- Through the looking glass*

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I would like to take this opportunity to express my appreciation to the numerous people who assisted me in the preparation of this document.

In particular, I would like to thank Mrs. C. Marriott Dept. of M.N.R.E. for her patience in typing (and retyping) the various drafts. Ms. B. Baldwin Dept. of Northern Affairs for her excellent research, her assistance in writing drafts of various sections and her editing ability. Mr. W. Barto Dept. of M.N.R.E. for his valuable and constructive editing comments and his assistance with the report format. Mr. H. Schell Dept. M.N.R.E. for his skill in drafting and his creative expression in the layout and design despite time and money constraints.

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I wish to say a special thanks to the staff of the northern region of M.N.R.E., both present and former, for allowing me to draw on their wealth of knowledge, their constructive criticism and their patience with my continual requests.

Other persons who assisted with the project to varying degrees were: Mr. K. Davidson (M.N.R.E.), population, economic and analytical assistance; Mr. B. Kerr (M.N.R.E.), research and updating various sections; Mr. C. Wall, editing and someone to follow.

Now that I finally have this document together I can only say thanks to all of you, without whom it would not have been possible.

Preface

The majority of the research, writing and organization of this document was done in late 1976 and early 1977. Material for updating it was obtained over the period of September to December of 1978. The majority of the information presented is current to 1975/76 and where possible the fall of 1978.

The metric system is used in the presentation of most measures of distance, depth and area, although the English system is used in volumes. The mapping scales are in miles per inch.

This document is published by the Manitoba Department of Mines, Natural Resources and Environment (MNRE). References in the bibliography and in the text to the Department of Mines and Natural Resources (MNR), the Department of Mines, Resources and Environmental Management (MREM) and the Department of Renewable Resources and Transportation Services (RRTS) are but earlier forms of MNRE. In addition, the Parks Division formerly the the Department of Tourism, Recreation and Cultural Affairs (TRCA) is now a part of MNRE.

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Introduction

Land is the common denominator the unifying factor in all society, for it is from the land that all things originate. It is for this reason that when society makes demands for any sort of good or service it translates into a demand on the land base. The land, however, is not endless as are demands, thus conflicts arise.

Judicious planning will facilitate the lands ability to meet demands and mitigate land use conflicts.

Information Package

The information package type of document, as implied by the name, is merely a collection of information. Its primary purpose is to provide a common base of ecological, resource and socio-economic information on Crown lands. Its use will be for the formulation of goals and objectives regarding land use and to aide in the specific allocation of Crown lands to specific uses.

Mid North Planning Zone

The Mid North is the developed north. It is that portion of northern Manitoba (Map 1) containing the roads, parks, mines and dams.

The planning zone encompasses an area of approximately 154 thousand square kilometers of which about 17 thousand is lake surface. The five largest lakes are Southern Indian, Moose, Cedar, Reindeer and Playgreen which have a combined area of over 6.2 thousand square kilometers. The major rivers, all of which drain to Hudson Bay, are the Saskatchewan, the Nelson, and the Churchill.

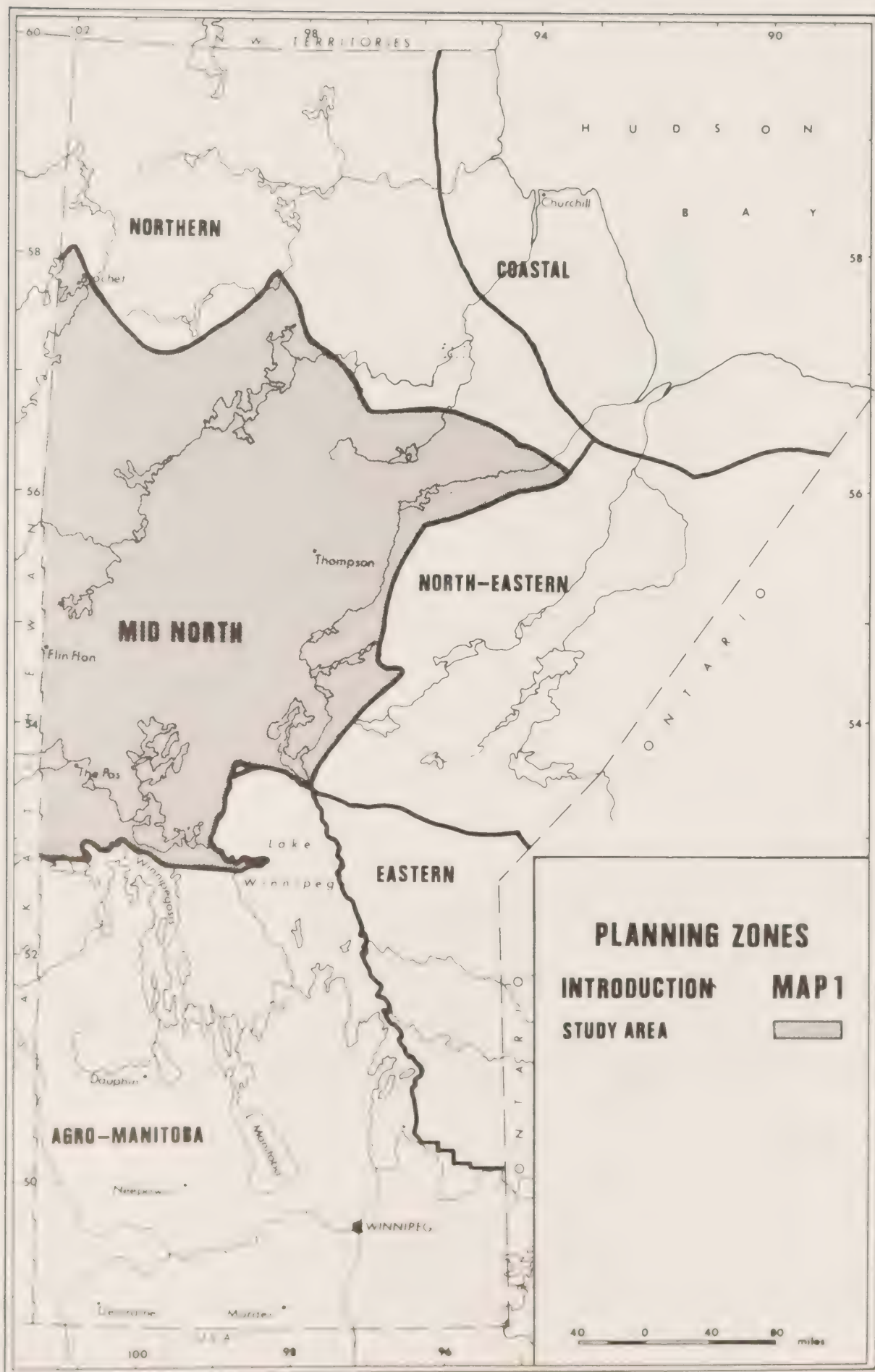
The vast majority of land is owned by the Crown, the parcels of private land being limited to areas in and around the various communities. The only large tract of private land is found in the Pasquia valley southwest of The Pas.

The principal urban centers are Thompson, The Pas and Flin Flon. The zone also has 25 other communities of various smaller sizes.

The mining, service and forest industries are the major employers and thus vitally important to the northern economy.

The zone population is approximately 67,500 of which nearly 60 percent live in the three principal urban centers. In general, the Mid North population is younger, has a higher proportion of males and and is more rapidly increasing than the provincial average.

The Mid North is the most densely populated, has the highest degree of infrastructure development the best resource potential and the largest number of resource commitments of the northern planning zones.





History

The historical background of the Mid North Planning Zone as presented, is that selected portion of history which was felt to be significant to the present land use and resource commitments of the Zone. It is not the intention of this document to relate archaeological history and early explorations unless these events have shown significant impacts on the present status of the land or its peoples. Historical highlights of the Zone have been noted in the respective resource section of this document.

Early People

The cultural and traditional roots of the indigenous peoples dictate to a certain extent present patterns of settlement as well as a natural resource oriented existence. With the exception of the Barren Lands Indians, all bands in the Zone had historically similar backgrounds. The Algonkian speaking Cree depended on game, fish and wild fruits for sustenance. In keeping with the migratory life style, portable dwellings and highly developed modes of transportation evolved. Snowshoes, canoes and toboggans carried the small bands in search of food.

The Athapaskan speaking Chipewyans of the Barren Lands depended on caribou, moose, hare, fish and berries to supply them with clothing and food. The Chipewyan were a migratory people and in spring many of them followed the caribou north to the barren grounds and returned to the forest for the winter.

The traditional patterns of life in the north, basically the dependence on natural resources, had influenced the patterns of settlement and to a degree resource allocations in the Zone.

Fur Trade

With arrival of Henry Kelsey in 1690, the Mid North Planning Zone moved formally into the fur trade era. Prior to this time furs had been shipped to either Hudson Bay or Montreal through a complex system of middlemen.

Kelsey, in the service of the Hudson Bay Company, journeyed inland from York Factory by way of the Nelson River, Cross Lake and Minago River to the vicinity of The Pas. Through his expeditions it was realized that the Nelson and Saskatchewan River systems were the keys to the entire North-West trade.

After 1713 (Treaty of Utrecht) French competition continued by way of inland routes while trade flourished with the Hudson's Bay Company on the Bay. La Vérendrye, between 1713 and 1749 mapped new inland routes and established a chain of posts including Fort Bourbon on Cedar Lake (1742) and Fort Paskayac (1749). These forts cut across the routes followed by the Indians trading at York Factory and consequently diverted a goodly portion of the trade.

The inland system of the French was based upon the birchbark canoe and local supplies as opposed to the tidewater system of the Hudson's Bay Company, oriented along the major river system leading to Hudson Bay.

After 1763, free traders from Montreal or pedlars began to penetrate the Mid North Zone along the same routes as had La Vérendrye. The Hudson's Bay Company, established its first inland post at Cumberland House on the Saskatchewan River in 1774. The competitive years that followed saw a number of trading posts become established in the Planning Zone (Map 1), the most important being that of Jack River House at Mossy Point which was later known as Norway House. Norway House functioned as not only a trading post, but a clearing house for goods travelling from the region up the Hayes River system to York Factory. It gained more importance after the establishment of the Red River Colony.

The North-West Company established a number of posts between 1786 and 1804. Because the Saskatchewan River represented a key transportation route not only to the east-west trade of the Nor'-Westers, but to the north-south system of the Hudson Bay Company along the Nelson River the Cedar Lake post became very important.

With the merging of the Hudson Bay Company and the North-West Company in 1821 until surrender of its charter in 1870, the Hudson's Bay Company maintained a virtual monopoly on the North-West fur trade.

Many of the posts established during the fur trade are now formalized settlements such as Cross Lake, South Indian Lake, Norway House and The Pas. The lakes and rivers used by early traders now offer excellent recreational potential. Although trapping has lost its economic importance to the North, it still remains a traditional activity for many people.



HISTORICAL TRADING POSTS
 -see extended legend

MAP 1.
HISTORY

MID NORTH
PLANNING ZONE

1 inch: 40 miles

Legend

Map 1

<u>NUMBER</u>	<u>NAME</u>	<u>DATE</u>	<u>COMPANY/FUNCTION</u>
1	Jack River House	1801 - 1817	HBC Trading Post
2	Norway House II	1826 - present	HBC Inland Depot
3	Norway House I	1814 - 1824	HBC Depot and Way Station
4	Cross Lake House	Unknown	NWC Wintering Post
5	Sipiwesk Lake House	1792	HBC Wintering Post
6	Chatham House	1791-2	HBC Wintering House
7	McKay's House	1790 - 94	NWC Wintering Post
8	Split Lake House	1790 - 1833	HBC District Post for Nelson River
9	Whites House	1793 - 94	Can. Wintering Post
10	Reed Lake House	1794 - ?	HBC Wintering Post
11	Cranberry Portage House	1804	NWC Wintering Post
12	Pelican Lake House	1793 - 94	HBC Wintering Post
13	Burntwood Lake House	1793 - 94	NWC Wintering Post
14	Rat River Fort	1789 - 94	NWC Wintering Post
15	Nelson House	1800 - 27	HBC District Post for Nelson River
16	Musquawegan	1804 - 05	NWC Wintering Post
17	Indian Lake House	1803 - 05	NWC Wintering Post
18	Baldwin's House	1793	Can. Wintering Post
19	Wappisow's (White's) House	1793	Can. Wintering Post
20	Duch Portage House	1795	HBC Wintering Post
21	Grand Rapids	1808	HBC Portage Point
22	Cedar Lake House	1857	HBC Wintering Post
23	Fort Bourbon	1741 - 1802	French Trading Post
24	Moose Lake Fort	1819 - 1824	NWC Wintering Post
25	Fort Pasquia I	1751 - 1758	French Trading Post
26	Fort Pasquia II	1769 - 80	Can. Wintering Post

HBC - Hudson Bay Company

NWC - North West Company

CAN - Canadian



The Environment

Geology

Geology of the Mid North Planning Zone is discussed under two broad sections, bedrock and surficial. The technical level of the discussion is purposely generalized wherever possible except when necessary for clarity. The reader is referred to the literature cited for detailed geological information on the zone.

Bedrock Geology

The geological history of the Zone can be divided into four major time periods: The Precambrian, Palaeozoic, Mesozoic, and the Cenozoic. The forces at work in each period have played some part in creating the lithology now found.

The Precambrian Era, the oldest and longest, saw the effects of volcanic activity, sedimentation, mountain-building and denudation. Igneous, sedimentary, and metamorphic rocks were developed in this era. The Precambrian Shield of the Planning Zone is divided into two geologic provinces, the Superior and the Churchill (Map 1). These are separated by profound unconformities, or where absent by orogenic fronts. The contact between the two provinces is marked by a strong northeast striking gravity anomaly. This anomaly ("gravity low") coupled with intense deformation and serpentine intrusions is representative of an ancient mountain chain.

The Superior Province is characterized by a predominance of easterly trending structures of volcanic-sedimentary belts in which volcanic rocks predominate. Radioactive age determination has dated rocks of this province at about 2300 million years. Sedimentary-volcanic belts of the Churchill Province trend in various directions and sedimentary rocks are more abundant than volcanic rocks. The rock in this province are more highly and extensively metamorphosed and more complexly folded than in the Superior Province. Rocks of the Churchill Province have been dated at about 1700 million years.

Igneous or Crystalline rocks of the Precambrian Shield are extremely variable in colour, texture and composition. Many are granodiorite or quartz diorite in composition and are usually younger than the volcanic



DESIGNATION OF GEOLOGICAL PROVINCES WITHIN THE PLANNING ZONE

MAJOR FAULTS

ROCK AGES (MILLIONS OF YEARS)

PROVINCE BOUNDARIES

Source: Davies 1962, Energy & Mines, Canada, 1972

MAP 1

GEOLOGY

MID NORTH

PLANNING ZONE

1 inch:40 miles

or sedimentary belts. Complexes of granitized para-gneisses and para-schists are frequent in the northern portion of the Planning Zone. Volcanic rock such as basalt, andesite and metamorphosed derivatives (such as hornblende schists) and their intrusive equivalents are found in the Lynn Lake and Flin Flon-Snow Lake Areas (Map 2). Occurrences of gold, copper, zinc, nickel, iron, chromium, lithium, beryllium and other rare elements have been found in volcanic sedimentary belts within the Planning Zone.

Considering known mineral occurrences and value of mineral production, the Churchill Geologic Province surpasses the Superior Province as one of the most outstanding mineral areas of Manitoba. Within this area are situated:

- copper and zinc deposits of the Flin Flon district,
- sulphide deposits, gold-bearing quartz veins and lithium bearing pegmatite dykes of the Snow Lake-Wekusko Lake area,
- copper-zinc deposits of the Sherridon area,
- nickel-copper, copper-zinc and gold deposits of the Lynn Lake area, and
- numerous nickel deposits of the Thompson belt.

A long period of erosion followed the Precambrian mountain building resulting in a peneplain. During the Palaeozoic, this peneplain was periodically covered by oceans allowing for the depositions of Silurian, Devonian, and Ordovician rocks. Limestones, dolomites and associated shales and sandstones being deposited. Exposures of Palaeozoic rocks occur in the region south of Cranberry Portage. Mineral products obtained from Palaeozoic formations include calcium limestone and dolomitic limestone.

The only occurrence of Mesozoic rocks in the Mid North is a portion of the Swan River Formation located in the southwestern corner of the Zone. Sandstone and shale beds, which contain minor amounts of lignite comprise this formation. They are considerably shallower than those found in southern Manitoba.

The Cenozoic Era which followed the Mesozoic Era is represented in the Zone by the Pleistocene epoch. The Pleistocene (or recent) had the greatest effect upon the nature of the topography. It saw the advance and retreat of four major ice sheets which resulted in the deposition of boulders, eskers, moraines, drumlins and glacial tills. These movements resulted in extensive erosion throughout the Zone characteristically



BEDROCK GEOLOGY

PRECAMBRIAN

VOLCANIC ROCK

ARKOSES & QUARTZITES

COMPLEX OF GRANITIZED
SEDIMENTARY GNEISS & SCHIST

GRANITIC

PALEOZOIC

LIMESTONE & SANDSTONE

MESOZOIC

SANDSTONE & SHALE

source: Davies 1962

MAP 2

GEOLOGY

MID NORTH
PLANNING ZONE

1 inch:40 miles

leaving shallow soils, striated rock and the resultant generally flat terrain. Much of the Zone was inundated by glacial Lake Agassiz from 9000-7500 B.C. following the retreat of the Wisconsin ice sheet (most recent). The northeast section of the Zone probably remained under water past this date.

Surficial Geology

The product of recent geological history is a topography which although generally flat may show radical local variations (Map 3). There exists a gradual descent (about 420 meters) from the Saskatchewan border northeast to Hudson Bay at sea level (a distance of about 600 km), the only noticeable descent being the falls of rivers.

A number of glacial features exist in the Planning Zone, moraines formed when glacial tills accumulated at an ice edge occur throughout. These irregular knobby hills interspersed with basin-like hollows comprise The Pas, Hargrave and Sipiwesk moraines in the southwest corner of the Zone (Map 4). The area above the escarpment is a poorly drained fluted till plain ranging in width from one half to four kilometers. Maraines belts are usually composed of Precambrian till, clay and calcareous till, and may contain sand and coarse gravels.

Eskers are numerous throughout the Zone, although only the largest have been mapped. Eskers were deposited in stream channels under decaying glacial ice and now exist as long senuous ridges composed of sand and gravel which may be many kilometers long and hundreds of meters wide. The highly porous nature of the components (sand and gravel) and the resultant rapid water drain from the top of the esker may inhibit vegetative growth.

Drumlins, consisting of glacial till, appear as smoothly rounded oval hills which are found in the vicinity of moraines. The long axis of each drumlin, often measuring nearly a kilometer, parallel the direction of ice movement. Drumlins may be found in the Moose Lake area.

Drumlinized drift plains usually contain extensive esker systems which tend in the same direction as the drumlinized ridges. The relief is moderate with extensive elongated bogs; fens occur in depressions between ridges. Examples of this feature are found near Split Lake and northeast of Reindeer Lake.



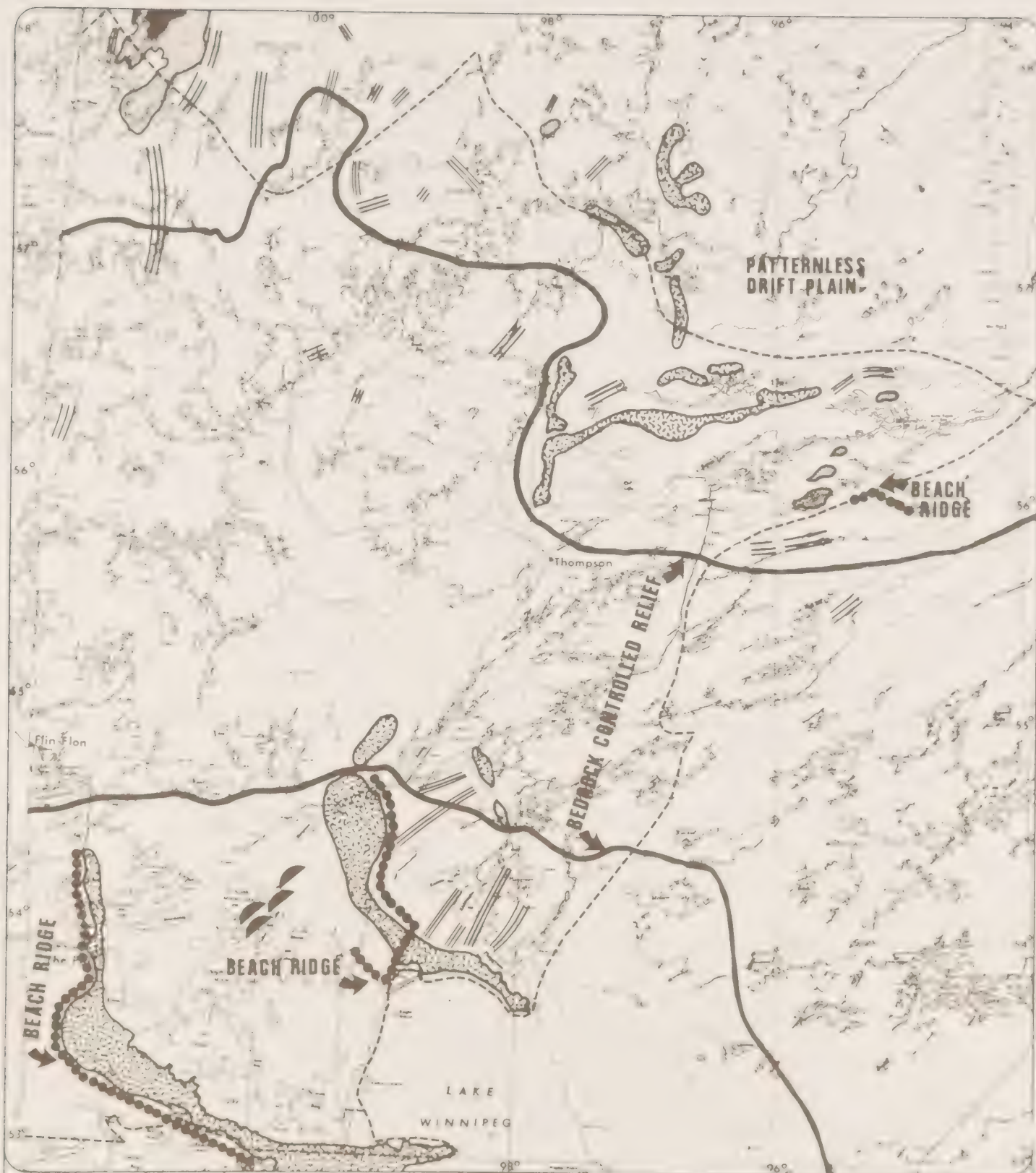
TOPOGRAPHY OF THE MID NORTH (100 FT. INTERVALS)

MAP 3 GEOLOGY

MID NORTH
PLANNING ZONE

source: Man., Dept. of M.R. & E.M.

linch: 40 miles



SURFICIAL GEOLOGY OF THE MID NORTH
 PEAT MANTLE AND DRUMLINIZED DRIFT PLAIN
 ESKERS
 DRIFT PLAINS (DRUMLINIZED)
 DRUMLINS
 MORAINES



MAP 4 GEOLOGY

MID NORTH
PLANNING ZONE

1 inch = 40 miles

Patternless drift plains composed of thick deposits of glacial drift overlay bedrock. Relief is low and following with extensive bogs occurring in depressions. This is the most common surficial feature of the northern and northeastern portion of the Zone.

Till plains result when ground moraines are spread thick and smoothly over a region which was flat prior to glaciation.

The Natural System

The environment or biotic community is composed of a number of basic factors--climate, water, soil, plants and animals (including man).¹ The interaction of these components provides each organism with its particular habitat. Each organism in turn affects changes in its immediate surroundings, thereby influencing the lives of other inhabitants of the biotic community. The study of these interactions is termed ecology. The natural system of interactions of any particular place and time is called an ecosystem. The biotic communities found in the Mid North Planning Zone have adapted to and are supported by their own unique set of physical and biological circumstances.

As every human land use affects the natural ecosystem in some manner, any proposed development plan will thus effect the biotic community. The reader is thus referred to the resource use sections (Recreation, Forestry, etc.) for changes to the environment of the Mid North Planning Zone.

The natural environment of the Mid North Planning Zone is a result of a series of complex interactions between a number of dependent and independent variables. Despite their complexity and interdependence, it is considered more practical to deal with groups of factors separately. Thus certain factors of the natural system are dealt with individually and interaction between components are discussed generally. The components are discussed under the following headings; climate, water, vegetation and soils fauna.

¹ Man's role as a member of the biotic community is specifically dealt with in the discussion of the use of the resource and as such he is excluded from discussion in this section.

Climate

The Mid North, as all of northern Manitoba, is classified as a Dfc climate region under the Koppen-Geiger climate classification system. This climate region is common across northern Canada including portions of the Northwest Territories and stretches into Alaska. This area is termed a snow climate and is characterized by having its warmest month over 10°C and its coldest month under -3°C.

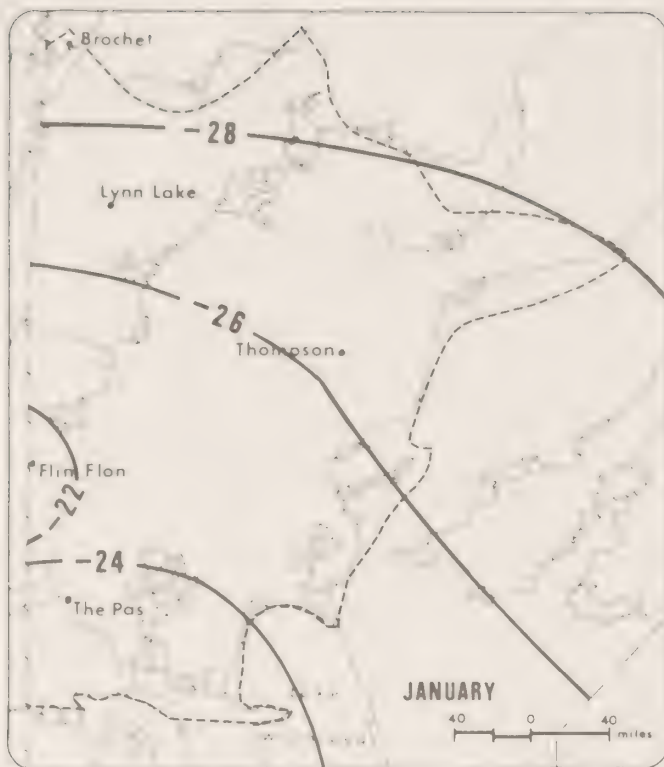
Thus Dfc refers to a cold, snowy forest climate with cool short summers. This climate is generally known as a continental sub-arctic climate and is particularly characterized by enormous annual temperature ranges. Map 1 shows average July and January temperatures for the Zone.

The moisture regime is an important component of the living community. The Mid North averages about 48 centimeters (19 in.) of precipitation annually (Table 1). Large areas where bedrock is near the surface, combined with areas of permafrost (northern portion of Zone Map 2) result in much of the water remaining near the surface. Low soil and water temperatures for much of the year retard plant growth particularly in the northern and northeastern portion of the Planning Zone.

Freeze-up and break up dates for various communities within the Zone are shown on Maps 3 and 4. These dates are of particular importance to a number of communities which depend on winter roads or water for transportation, and are also significant in determining recreational seasons.

Sunlight hours fluctuate dramatically on a seasonal basis. During the summer growing season, days are long maximizing the effort of the short number of frost free days. However, net annual radiation generally increases from north to south (Map 5).

Apart from temperature and precipitation detailed weather data for most of the Zone is not available. Appendix A lists more detailed meteorological information in the Zone. Table 2a lists some of the more specialized climatic data which is available for selected communities. Those communities given are those in and around the Zone for which data was available. Table 2b denotes climatic extremes within the Zone.



MAP 1. NATURAL SYSTEMS

MEAN DAILY TEMPERATURE
IN DEGREES CELSIUS

BASED ON PERIOD 1940-1971

APPROXIMATE ISOTHERMS —

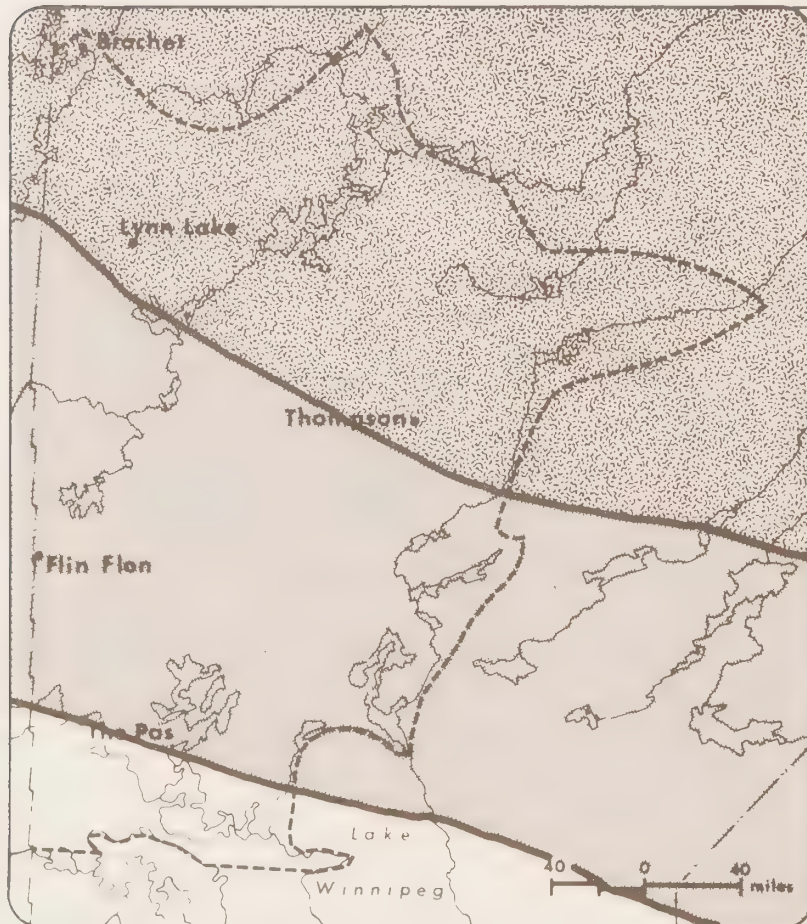
SOURCE: ENVIRONMENT CANADA

Table 1

Normal^a Mean Total Precipitation (Millimeters)

Location	January	February	March	April	May	June	July	August	September	October	November	December	(mm) Year	(in) Year
Brochet	19.3	12.4	19.6	20.8	35.8	48.0	67.8	51.6	59.7	38.1	29.2	23.9	426.2	16.8
Flin Flon	20.6	19.8	22.9	18.3	36.6	67.6	74.4	65.5	53.1	29.7	26.9	22.9	458.3	18.0
Gillam	14.2	11.9	17.0	16.0	28.4	50.0	76.5	65.0	58.2	34.8	26.7	17.8	416.5	16.4
Laurie River	26.2	17.8	20.8	20.8	40.4	79.5	76.2	84.1	52.6	28.4	35.3	32.8	514.9	20.3
Lynn Lake	17.5	15.2	19.3	26.4	30.5	63.5	74.2	65.5	63.8	31.2	27.2	23.6	457.9	28.0
Norway House	16.3	19.6	21.1	27.9	43.4	82.3	67.1	56.9	44.5	17.5	33.0	29.2	458.8	18.1
Pasquia	19.8	17.0	22.6	22.9	36.1	54.1	73.4	62.7	57.9	27.9	25.7	24.4	444.5	17.5
The Pas	25.1	22.6	22.6	26.7	41.4	58.7	79.2	65.3	59.9	29.2	35.1	25.9	491.7	19.4
The Pas Airport	18.5	16.5	20.6	25.4	37.8	58.2	72.4	61.5	55.1	30.7	29.0	22.9	449.6	17.7
Wabowden	19.3	15.7	18.3	23.9	38.6	65.0	75.7	65.5	59.2	33.3	27.2	24.1	465.8	18.3
Wanless	22.4	18.3	20.6	22.1	35.8	70.6	65.0	58.9	47.8	32.5	35.6	24.9	454.5	17.9
Thompson ^b	20.6	10.9	16.3	27.4	48.3	78.2	74.2	79.2	68.1	32.5	37.8	37.8	564.1	22.2
Grand Rapids ^b	20.6	15.5	27.7	19.8	35.1	69.3	61.5	53.1	65.5	25.7	32.5	27.9	475.2	18.7

Source: Environment Canada, 1975.

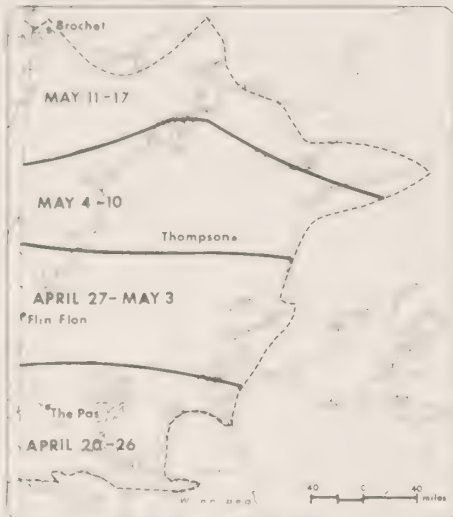
^a'Normal' based on most number of years of available data (up to 30 years) for the period 1941 to 1970.^bData years 1967-1974.

MAP 2. NATURAL SYSTEMS

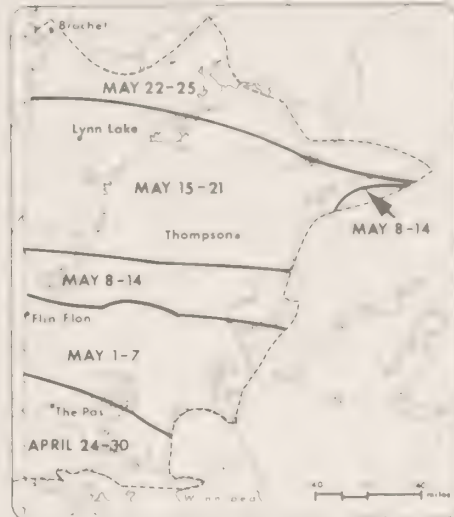
PERMAFROST

- Scattered
- Widespread

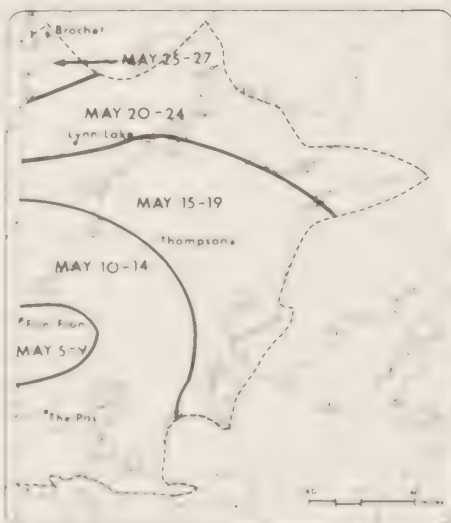
Source: Fisheries and Environment Canada, 1978



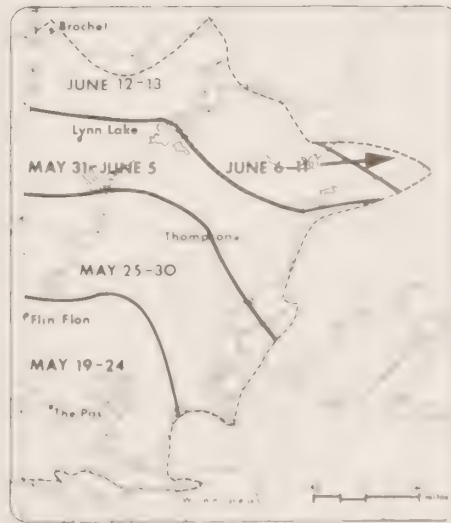
INITIAL BREAK-UP OF RIVERS



FINAL BREAK-UP OF RIVERS



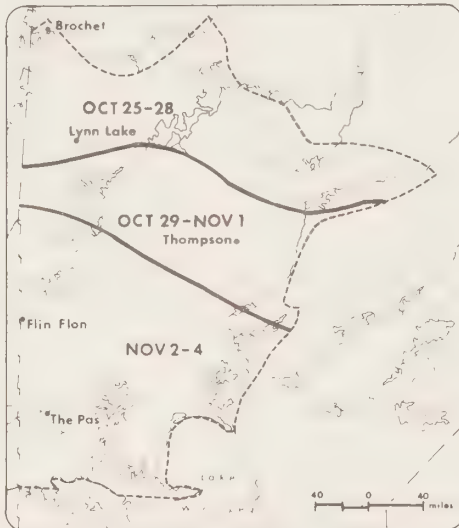
INITIAL BREAK-UP OF LAKES AND BAYS



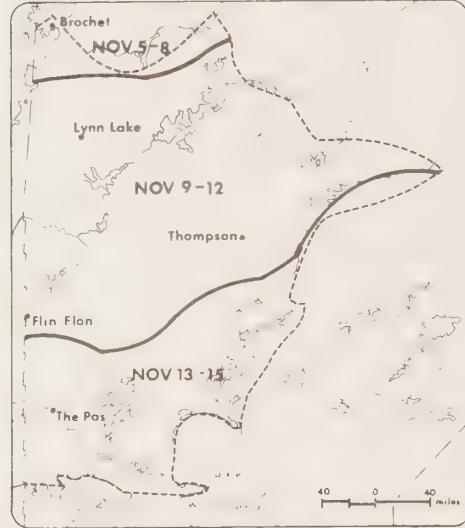
FINAL BREAK-UP OF LAKES AND BAYS

**BREAK-UP DATES FOR WATERS
IN THE MID NORTH**

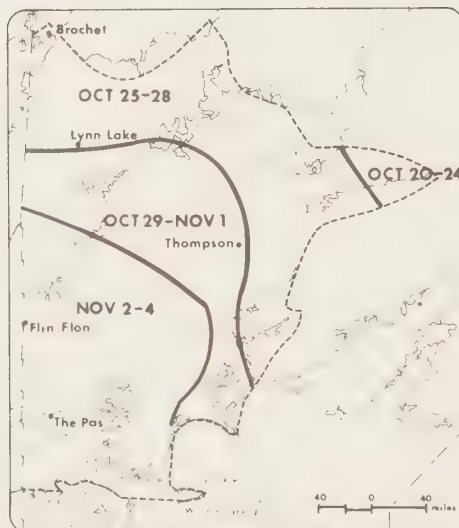
**MAP 3.
NATURAL SYSTEMS**



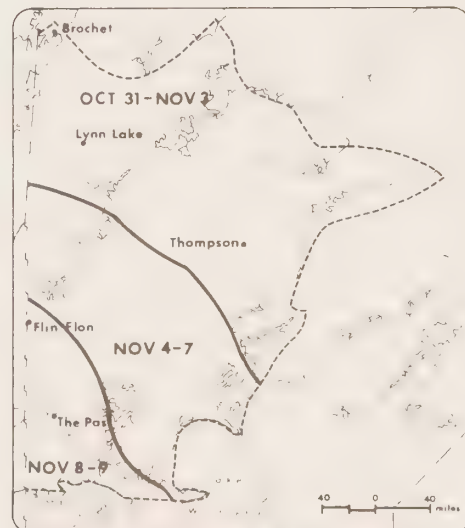
INITIAL ICE IN RIVERS



FINAL FREEZE-OVER IN RIVERS



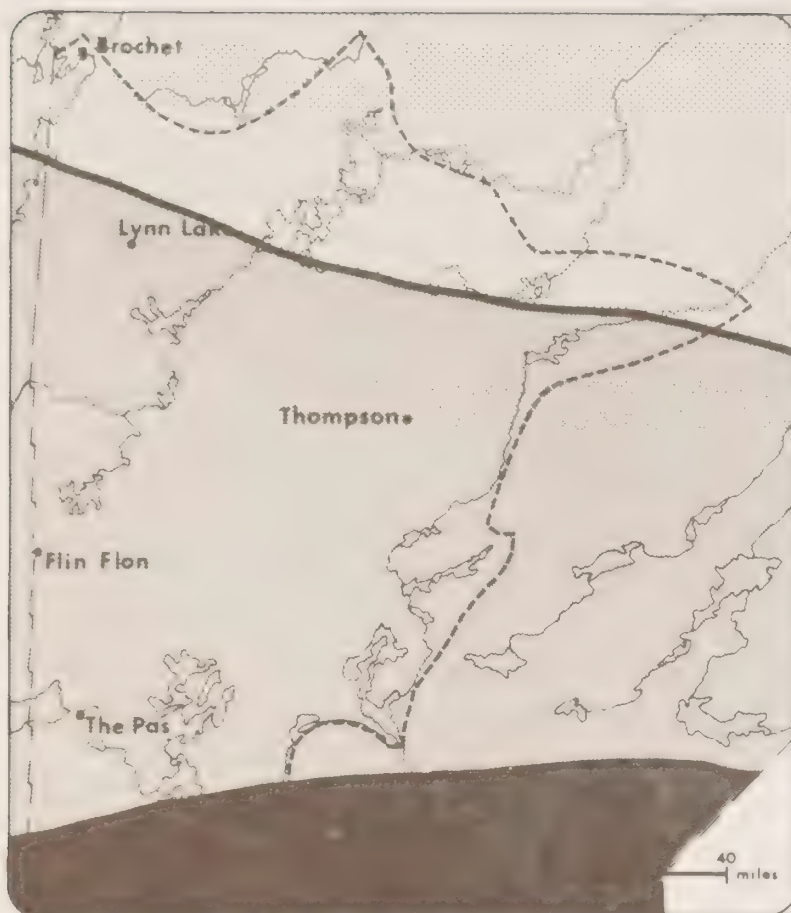
INITIAL ICE IN LAKES AND BAYS



FINAL FREEZE-OVER OF LAKES AND BAYS

**FREEZE-UP DATES FOR WATERS
IN THE MID NORTH**

**MAP 4.
NATURAL SYSTEMS**



MAP 5. NATURAL SYSTEMS

MEAN NET SOLAR RADIATION*
(Kilocalories/cm²)



* Source: Fisheries and Environment Canada, 1978

Table 2a

Average Annual Climatic Data For Selected
Stations In The Mid North And Environs
(1931 - 1960)

	The Pas	Brochet	Gillam	Dauphin	Churchill	Wabowden
Bright Sunshine Hours	2067	-	-	2271	1798	-
Frost Free Days	113	-	-	127	78	-
Last Spring Frost	May 25	-	-	May 20	June 25	-
First Fall Frost	Sept 16	-	-	Sept 25	Sept 12	-
Growing Season Precip (in)	8.94	8.24	8.66 ^b	10.67	7.31	-
Thunderstorm Days	20.7	11.3	7.9	25.2	5.6	10.5
Hail Days	3.9	-	-	1.7	-	-
Growing Degree Days	2236	1570	-	-	888	-
Precipitation (in)	17.70 ^a	16.78 ^a	16.40 ^a	19.46	14.25	18.3
Temperature (°C)	- 0.3	-5.2	-4.8	1.6	-7.3	-2.2

Source: Environment Canada various sources.

^a1931 - 1974

^b1960 - 1974

Table 2b

Climatic Extremes 1941-1970
Mid North Zone

Type	Amount	Location	Years of Data
Greatest Rainfall in 24 Hours	78 mm	The Pas	57
Greatest Snowfall in 24 Hours	48.8 cm	Brochet	22
Extreme Maximum Temperature	40°C	Flin Flon	43
Extreme Minimum Temperature	-52.8°C	Norway House	44
Maximum observed Wind Speed	116.8 KPH	The Pas	18
Thunder Days	20.7	The Pas	U
Most Average Sunshine Hours	2108	The Pas Airport	U
Most Average Frost Days	249	Gillam	15-19

Source: Environment Canada 1975

U: Unknown

Water

The province has been divided into 11 principal watersheds which include the total surface water system of Manitoba.² All surface water systems (except for landlocked drainages within a system) ultimately terminate in Hudson Bay (Map 6). Many of these systems originate outside the province, in fact only three small systems are wholly contained within Manitoba.

There are seven major river systems in Manitoba, three of which are found in the Mid North Planning Zone. Of those rivers external to the Zone, the Red River system and the Winnipeg River system, flow into the Nelson via Lake Winnipeg and thus through the Zone to Hudson Bay.

A number of control and hydro electric generating structures have been constructed on the Red and Winnipeg Rivers. The Hayes River system has one generating structure (now abandoned) and the Seal River is presently in its natural state.

The water resources of the Planning Zone are one of the most important in the province being used for power generation, drinking water, recreation, commercial fishing and trapping.

The Zone's three major rivers are the Saskatchewan, Nelson and the Churchill. The Nelson River drops 217 meters from Lake Winnipeg to Hudson Bay and the Churchill River descends 262 meters from the Saskatchewan border to the Bay. There are a number of very large lakes all or partially within the Zone (Table 3). The surface area of the 20 largest lakes is about 10,400 square kilometers.³ Map 7 illustrates the various watershed breakdowns and the locations of active hydrometric sites within the Planning Zone. Table 4 presents the mean annual stream flow data for the rivers that have been monitored.

²Inland Waters Branch, 1966

³Total surface area of lakes in the Planning Zone is about 17,000 km². See Appendix B for lake depths.



HYDROLOGY

MAIN DRAINAGE DIVISION

DIRECTION OF WATER FLOW

SUBDIVISION

MAP 6.

NATURAL SYSTEMS

MID NORTH
PLANNING ZONE

Source; Modified from Fedoruk, 1970.

1 inch:40 miles

Table 3
Surface Area of Selected Mid North Lakes

Lake	Area (km ²)	(mi ²)
Southern Indian ^a	1984	(766.1)
Moose	1391	(536.9)
Cedar	1261	(487.0)
Reindeer ^b	895	(345.6)
Playgreen	691	(226.6)
Cross	572	(221.0)
Granville	456	(176.0)
Sipiwesk	393	(151.8)
Cormorant	328	(126.6)
Kississing	324	(125.3)
Clearwater	289	(111.5)
Split	284	(109.6)
Gauer	259	(99.8)
Kiskittogisu	254	(98.0)
Waskauiowaka	213	(82.1)
Athapapuskow	194	(75.0)
Reed	190	(73.3)
Wekusko	177	(68.2)
Kiskitto	171	(66.0)
Burntwood	166	(64.1)

Source: Schlick, 1977 ^aPrior to flooding

^bManitoba portion only

Table 4
Stream Flow Data

River	Mean annual flow (CFS)	Years Recorded	Station Location
Burntwood	4,070	1957-1976	Thompson
Churchill	29,500	1951-1976	Granville Falls
Churchill	38,900	1973-1976	Leaf Rapids
Churchill	39,800	1962-1976	Fidler Lake
Grass	2,560	1959-1976	Standing Stone Falls
Grass	425	1957-1976	Wekusko Falls
Kettle	462	1963-1976	Gillam
Kisipachewuk Ch.	11,700	1971-1973	Kiskittogisu Lake
Limestone	864	1963-1976	Bird
Metchanais Ch.	33,200	1971-1973	Kiskittogisu Lake
Moose	495	1971-1973	Moose Lake
Nelson	73,800	1967-1976	Jenpeg
Nelson	87,000	1958-1976	Bladder Rapids
Nelson	87,900	1960-1976	Kelsey
Nelson	91,900	1951-1958	Sipiwesk Lake
Ominawin Ch.	33,900	1971-1973	Kiskittogisu Lake
Overflowing	422	1956-1976	Overflowing River
Saskatchewan	25,700	1912-1976	Grand Rapids
Saskatchewan	23,900	1913-1976	The Pas
Taylor	180	1970-1976	Thompson

Source: Historical Streamflow Summary, Manitoba, Inland Waters
Directorate, Water Resources Branch, Water Survey of Canada,
Ottawa, 1977.



DRAINAGE BASINS AND HYDROMETRIC STATIONS
MAIN DRAINAGE DIVISION
SUBDIVISION
ACTIVE HYDROMETRIC STATIONS (LEVEL ONLY)
ACTIVE HYDROMETRIC STATIONS (STREAM FLOW)

MAP 7.
NATURAL SYSTEMS
MID NORTH
PLANNING ZONE

Vegetation and Soils

The vegetation and soils of the Planning Zone are discussed under two distinct types of subdivision; the forest region and the land region. The forest regions, discussed first, are those delineated by Rowe (1972) in The Forest Regions of Canada. The Land Regions classification is a biophysical based land subdivision used by the Northern Resources Information Program (NRIP). Following the discussion of land regions is a short list of some of the common ecosystems found in the Mid North.

FOREST REGIONS: The whole of the Mid North Planning Zone falls within the forest region known as the boreal forest. Four climatically significant forest land units called forest sections (Map 8) combine to form that portion of the boreal forest found in the Planning Zone.

Northwestern transition forest section is the most northerly in the Zone. This section is the forest fringe that fronts the tundra. It is characterized by unfavourable climatic conditions, this soils and frequent fires. These factors have combined to limit distribution, abundance and size of tree species. Open stands of dwarfed trees are scattered among areas of bog, muskeg and rock. Upland coniferous sites are characterized by their park-like appearance and ground cover of light-coloured foliose lichens. Black spruce is the dominant tree specie on all sites although it may be accompanied by white spruce on well drained soils. White birch and tamarack may also be associated species in this forest section and jack pine is not uncommon in the Planning Zone portion of the section. Stunted trembling aspen and balsam poplar are present, but balsam fir is not. The section has predominantly low relief and a shallow depth of glacial till over bedrock which accounts for a prevalence of water-filled depressions. Eskers, till ridges and rock knobs are common surface forms and ground frost is a feature common on all but the coarsest-textures soils.

The Northern Coniferous is a section where reasonable tree growth is permitted by climatic conditions and wherever soil depth allows, closed forests have developed. Thin soiled uplands feature black spruce as the predominate specie associated with jack pine. The frequency of fire has favoured the spread of jack pine and, to a lesser degree white birch. Poorly drained lowland areas are also characterized by black spruce and often associated with tamarack. Local areas experiencing

favourable soil and micro-climatic conditions may have mixed stands of white spruce, balsam fir, trembling aspen and balsam poplar. As a result of intense past glaciation, relief is irregular and characterized by parallel rock ridges separated by poorly drained depressions and large numbers of narrow lakes. Bare precambrian granites are often exposed or thinly covered by drift deposits. Poorly drained areas are peat-filled and valleys show humo-ferric podzol development. Map 9 illustrates the distribution of organic and associated great soil groups in the Mid North.

The Nelson River Section lies between two sections of northern coniferous forest. Black spruce is the dominant forest cover, however, extensive areas of poorly drained swamps serve to limit growth. In better drained areas good stands of white spruce are mixed with some balsam poplar, trembling aspen, white birch and balsam fir. The repeated high incidence of fire in the section has served to fragment the forest cover. As a result, extensive areas support young trembling aspen, white birch (with scattered jack pine), white or black spruce, or grassy scrub on rocky barrens. Tamarack is commonly associated with black spruce in poorly drained areas and isolated occurrences of Manitoba maple and green ash may be found along river banks. The section is characterized by its fairly level lacustrine clays and sands a result of glacial Lake Agassiz. The clays are shallow on the uplands and deeper in the valleys often extending considerable distances back from existing lakes. Well-drained sites typically develop podzolic profiles whereas gleysols are common on poorly-drained slopes. Moss and woody peat characterize the black spruce-muskeg.

The Manitoba Lowlands forest section is particularly noted for its flat poorly-drained land area and its patchy forest cover composed of black spruce and tamarack intermixed with swamps and wet meadows. Better drained alluvial strips bordering rivers and streams sometimes support good stands of white spruce, trembling aspen and balsam poplar. Balsam fir and white birch are also occasionally found in this association. Low ridges throughout this section are forested with a mixture of jack pine and trembling aspen. Other species such as green ash and Manitoba maple may be present locally. The section's soils are generally lacustrine clays over-laying palaeozoic limestone. These soils tend towards humic gleysols and peat in the more poorly drained sites. Some forested areas have shallow gray luvisol profiles with a highly calcareous substratum.



FOREST SECTIONS OF THE BOREAL FOREST

**MAP 8.
NATURAL SYSTEMS**

**MID NORTH
PLANNING ZONE**

SOURCE: ROWE 1972.

1 inch: 40 miles

Each forest section contains a number of smaller biological systems. These ecosystems are usually characterized by a dominant tree form and ground cover and are peculiar to a particular soil composition and moisture regime. Table 5 demonstrates the abundance of selected bog and fen species in relation to acidity and calcium levels found in various wet landforms.

Table 5

The Abundance of Selected Species of Wetland Plants
in Relation to the Nutrient Status of Different Communities

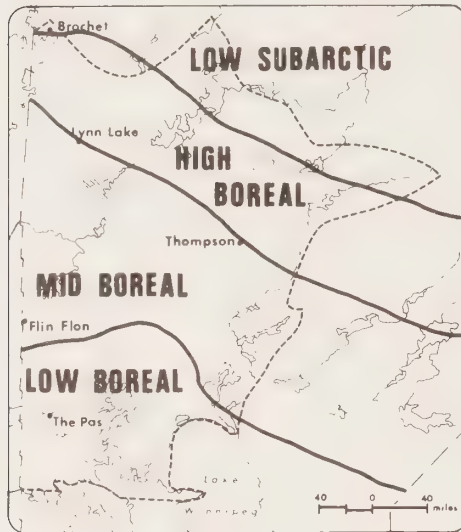
Species	TYPE OF WETLAND		Rich	Poor Rich	Poor-Med. Rich		
	ACIDITY	ext. acid	very acid	acid	sl. acid	moderately	alkaline
AS. PH.		3.4-4.2	3.8-5.	4.5-5.4	5.4-6.5	6.5-7.6	7.6 -
CALCIUM LEVEL		very low	low	moderate	moderate - high	high	very
Arrow grass (<i>Trilobochloa parviflora</i>)							
Three leaved Scilla (<i>Scilla trifolia</i>)					..		
Fen cotton grass (<i>Eriophorum spissum</i>)						..	
Wet's tail (<i>Eriophorum spissum</i>)			++				
Red sedge (<i>Carex lasiocarpa</i>)			+++	++			
Red-seeded sedge (<i>Carex diandra</i>)			+	+++			
Yellow sedge (<i>Carex flacca</i>)							
Large's clipper (<i>Cyrtopogon calceolus</i>)							
Fitcher plant (<i>Sarracenia purpurea</i>)			++	+++			
Marsh cinquefoil (<i>Potentilla palustris</i>)				+			
Shrubby cinquefoil (<i>Potentilla fruticosa</i>)							
Lowberry (<i>Rubus chamaemorus</i>)			+++				
Red bear (<i>Menyanthes trifoliata</i>)							
Lutescent fern (<i>L. trichomanes</i>)							

Source: Modified from Sparling 1973

+ occasional, ++ frequent, +++ abundant

Mod. = moderately rich, Calc. = calcareous

LAND REGIONS: Land regions (Map 10) are a separate bio-physical land classification system developed by the Northern Resource Information Program (NRIP) for Northern Manitoba. Unlike the forestry classification system, land regions more closely integrate soil and climate characteristics to vegetation.



**MAP 10.
LAND REGIONS**

**SOURCE: MODIFIED FROM NORTHERN
RESOURCE INFORMATION PROGRAM**

Land regions are delineated over large areas on the basis of vegetation, soil conditions and permafrost influence. Due to each of these conditions dependence on climate, there is an orderly zonation from south to north. This zonation tends to be complicated by local features (i.e., water bodies, valleys, etc.), with the result that soil-vegetation associations typical of adjacent land regions may develop. A summary of the biophysical properties of those land regions found in the Mid North are listed in Table 6 and 7. Climatic data characterizing the various regions are listed in Table 8.

Table 6
 Selected Biophysical Characteristics of Land Regions in the Mid North Planning Zone

Land Region	Vegetation Type	Dominant Soils	Organic Landform	Permafrost Regime	Other Geographical Active Layer (cm.)
Low Sub-arctic	Open Coniferous Forest	Brunisolic static Cryosol Brunisols, Luvisols Gleysolic Static Cryosol Organic Cryosol	Peat plateaus, palsas, bog veneer, fens	Discontinuous, Widespread	Mineral soils 40-100+ Organic Soils 40-60
Mid Boreal	Open Coniferous Forest	Brunisols, Luvisols Gleysolic Cryosol Organic Cryosol	Peat plateaus, palsas, bog veneers, fens	Discontinuous, Southern Fringe, (North)	Mineral soils 40-100+ Organic Soils 60
Mid Boreal	Open Coniferous Forest	Brunisols, Luvisols Gleysolic static Cryosol Organic Cryosol	Peat plateaus, palsas, bog veneers, bog plateaus, blanket bog, fens	Discontinuous Southern Fringe (South)	Mineral Soils 40-100+ Organic soils 60
Low Boreal	Mixed Deciduous - Coniferous Forest	Brunisols, Luvisols, Gleysols, Gleysolic	Bog plateaus, flat bog, blanket bog, fens	Localized	Organic soils 100-200

Table 7
Vegetation Characteristics of Mid North Land Regions

Land Region	Physiographic Area	Stable Vegetation Types					Wet Facies	
		Normal Facies			Impeded Drainage		Lakeshore	
		Warm-Drier (South Slopes, Sand)	Normal-Mesic (Level, Mod. Slopes)	Cooler-Wetter (North Slopes Bottom Lands)	(Sloughs, Kettles, Marshes)			Alluvial (Streamside)
Low Subarctic	Canadian Shield	Ws (JP)	Open Bs and Lichen	Open Bs and lichen moss	Bs - l bogs/ Bs - lichen-moss peat plateau and palsas/sedge - l cottongrass fens	Sedge meadow	Ws/Willow- db - alder	
High Boreal	Canadian Shield	Bs (JP, ta, wb)	Bs (JP, wb, ta)	Bs - mosses	Bs, l - sphagnum bog/ Bs - lichen - moss peat plateau/sedge - l - db fens	Sedge meadow	Ws/Willow db - alder	
Mid Boreal	Canadian Shield	Ws - bf - ta (JP)	Bs - bf - mosses	Bs - mosses	Bs - l - moss bogs (bog veneer, plateau bogs, sloping bogs, patterned fen) Bs - wb palsas and peat plateau	Rush-sedge meadow	Sedge-grass meadow	
Low Boreal	Canadian Shield	ta - wb (JP)	Ws - ta - bf - wb	Bs - ta - wb	Bs - l bogs	Sedge-rush meadow	Ws - bp	

Source: Northern Resource Information Program.

Symbols Used:

ta - trembling aspen
wb - white birch
JP - jack pine
ws - white spruce
bf - balsam fir
Bs - black spruce
bp - balsam poplar

l - larch
db - dwarf birch
- - associated species or groups of plants
/ - different communities in the same region
() - successional communities

Source: Northern Resource Information Program 1976.

- 1) Black spruce, jack pine, lichen on dry flacio-fluvial sand
- 2) Black spruce, sphagnum, feather moss on shallow organic over lacustrine, moist and influenced by permafrost
- 3) Black spruce, feathermoss, white birch on lacustrine and calcareous till, fresh to moist and influenced by permafrost
- 4) Black spruce, lichens on dry to fresh sandy till
- 5) Black spruce, feathermoss on shallow organic over lacustrine, associated with domed permafrost
- 6) Jack pine, lichen on precambrian bedrock
- 7) Black spruce, feathermoss on fresh lacustrine (over bedrock) associated with permafrost
- 8) Sphagnum, tamarack, black spruce on deep fibric or fibric over mesic organic
- 9) Black spruce, jack pine, feathermoss, lichen on dry to moist lacustrine over bedrock
- 10) Black spruce, sphagnum, feathermoss on organic over clay, influenced by permafrost
- 11) Black spruce, feathermoss on moist to fresh lacustrine
- 12) Jack pine, lichen on dry, glacio-fluvial outwash
- 13) Black spruce, sphagnum or fibric over mesic organic or fibric over mesic organic associated with permafrost
- 14) Sedges and stunted tamarack on saturated deep, mesic organic soils (fen community)
- 15) Sedges, stunted black spruce or tamarack on saturated sphagnum or forest with high water table or associated with open water

Fauna

The animal component of the ecosystem is dependent upon the climate, vegetation and availability of water. The Mid North's unique combination of biotic components serves to support about 375 different species of animal life.⁴ The uses some animals of the Zone may be divided, for purposes of discussion, into economic and non-economic species.

An economic specie, is one which is used commercially (e.g., beaver, muskrat, pickerel, lake trout), taken for sport (e.g., geese, white tailed deer) or used domestically (e.g., moose, whitefish). Non-economic species such as song birds and mice, although unimportant in dollar value are nonetheless an integral part of the ecosystem.

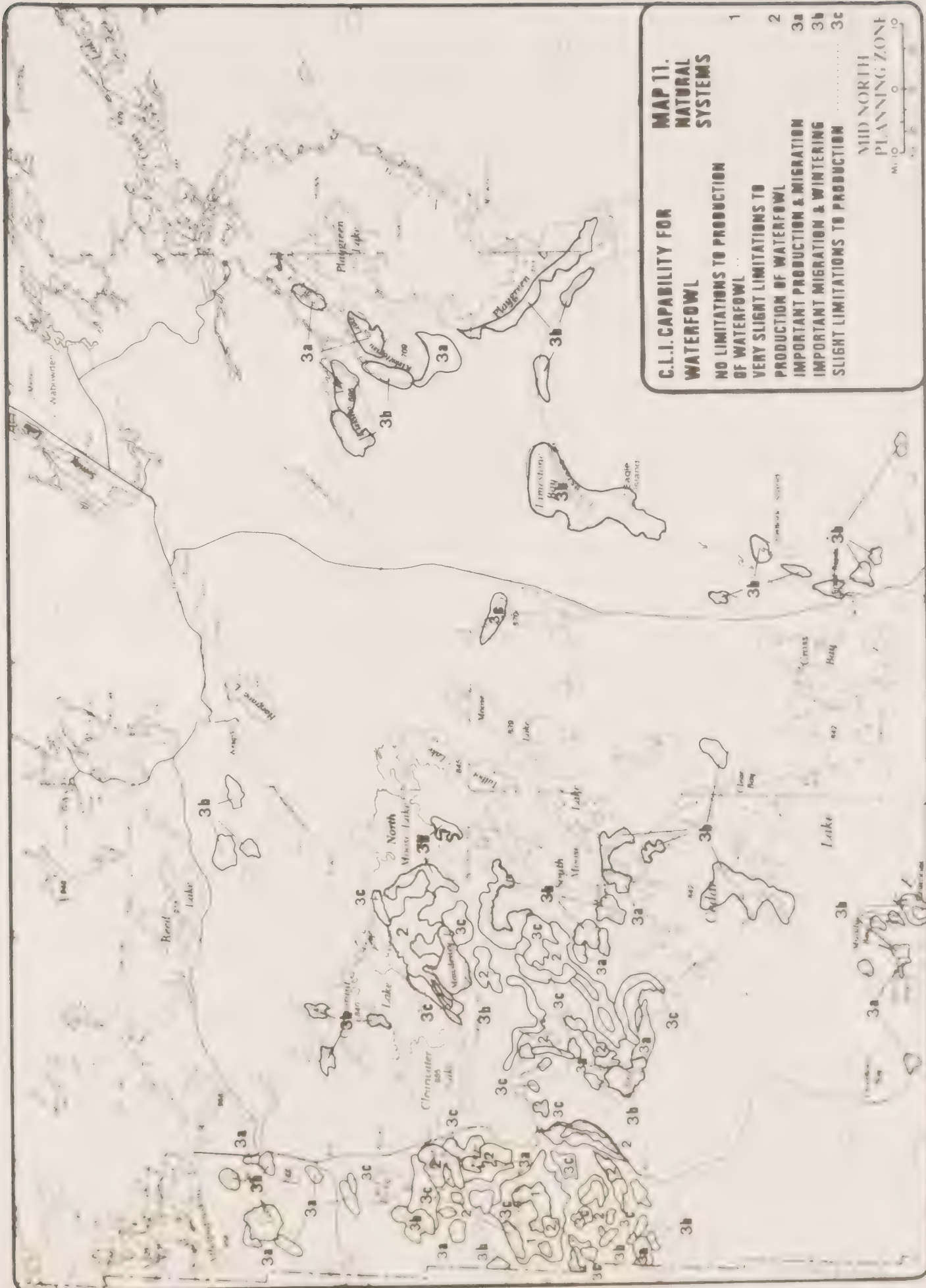
Discussion in this section will be primarily with the economic species found in the Zone, although other species are noted as components of the natural system. Species which are rare and/or endangered either nationally or in Manitoba are noted in the section of Special Areas.

BIRDS: A list of birds known or thought to occur within the Planning Zone is given in Appendix C. All migratory birds occurring in the Mid North are protected under the Migratory Bird Convention Act (1917) in order to fulfill international obligations as laid down by the Migratory Birds Convention (1916). The list of birds protected under the Act was last revised in 1974.

The economic species are limited to the ducks, grouse, ptarmigan, cranes and geese which are hunted for sport and domestic use. Grouse and ptarmigan are protected under the Manitoba Wildlife Act whereas ducks, cranes and geese come under Federal legislation.

Waterfowl are the best known species as to habits, numbers and distribution. Ducks Unlimited has done extensive work on waterfowl production and staging along the Saskatchewan River delta. Capability for waterfowl is shown on Map 11.

⁴ Excluding insects, spiders, etc.



The ecological niches and adaptations of different species of birds in the forest are associated with stratification and growth forms of plants. Some species essentially exist in a single stratum while others range over several. Birds tend to move more freely from one stratum to another, but even they are often limited. Ruffed grouse, spruce grouse, ovenbirds and some warblers essentially occupy the ground layer moving up into trees to feed or roost. Red-eyed vireos inhabit the lower tree stratum as does the wood peewee. Blackburnian warblers, Tennessee warblers, Cape May warbler and the olive-sided fly-catcher tend to dwell in the upper canopy. Woodpeckers, nut hatches and creepers tend to inhabit the open space areas of tree trunks between the canopy and shrub layer.

Species may vary with moisture regime as well as by vertical stratification. Xeric (dry) forest conditions are inhabited by species such as jays. Mesic (moderate) forests are preferred by thrushes, redstarts and fly catchers. Hydric (moist) sites are the homes of some warblers (Nashville), redpolls and sparrows.

Pine forests are generally the least preferred coniferous forest whereas spruce forests generally exhibit a greater variety of bird species. Mixed forests offer the greatest variety of niches and thus support the greatest number of different bird species.

Lakeshore, streamside and marsh fringes are the ecological niche of a large number of avian species. Ducks, geese and blackbirds are common in many marshes. Kingfishers, eagles and osprey, although not common, are found along streamsides. Sandpipers, gulls and other shore birds may be found on beaches, pebbly or gently sloping rocky shorelines.

From a management standpoint, the only birds in which an interest is shown are geese, ducks, cranes and grouse. Ducks Unlimited has constructed a number of water control facilities in the Saskeram Wildlife Management Area since 1962 with the intent of improving duck habitat. Annual counts of these birds are taken in order to estimate populations. Some preliminary work on raptors and colonial nesting birds has been done to determine population sized and locations.

AMPHIBIANS: Four species of amphibian are known to occur in the Mid North. The three frogs are the boreal chorus frog (*Pseudocris trisetiata*), the wood frog (*Rana sylvatica*), and the leopard frog (*Rana pipiens*) the most common Canadian frog. The Dakota toad, (*Bufo hemiophrys*) is the other amphibian found in the Zone.

REPTILES: The Garter snake is the only known reptile occurring within the Planning Zone.

FISH: Fish as are birds, can be divided into economic and non-economic species. Species such as pike and sturgeon are fished on a recreational and commercial basis. Shiners, darters and minnows are not of any apparent economic value except perhaps for bait fish. The majority of research has been done on the commercial and game species. Pickerel, trout, whitefish, goldeye, pike, sauger and sturgeon are commercially fished in the Mid North (see section on commercial fishing).

A list of fish species occurring in the Mid North Planning Zone is given in Appendix D.

From a habitat standpoint, apart from relating the obvious (i.e., fish live in water), trout, pickerel, grayling and sturgeon prefer cool, clear water, whereas pike, sauger and goldeye are not as particular. Eaters in the Zone can be considered cool, particularly in the northern portions, at all times. Most species found in the region reflect this habitat trait and either prefer cool to cold water or are extremely varied in their habitat adaptations.

MAMMALS: Most mammals occupy the ground surface niche of the forest area, although some may burrow into the ground or live in trees. The mammals of the Zone are listed in Appendix E. The Zone's mammals inhabit a wide variety of biomes; river otters along streams, muskrat and moose in marshes and lynx and hares in the upland areas. Mammals, also are divided into economic and non-economic species. Economic species are those hunted or trapped.

Hunted species in the Zone are limited to moose, deer, caribou and bear. A more complete breakdown of hunting in the Mid North can be found in the Recreation section of this report. A number of species are trapped for commercial or domestic purposes and the statistical information regarding trapping may be found in the section entitled Wild Fur Resources.

Little information about numbers and distribution of the majority of the smaller non-economic mammals is available (bats, voles, mice, etc.).

Whitetail deer (at the northern edge of its range) are not found in great densities anywhere within the Planning Zone. The maximum Canada Land Inventory (CLI) capability rating is moderately low (Class 5, Map 12). The greatest concentration of whitetail deer occur in the western Pasquia Valley area, southwest of The Pas. Deer populations are also found along river levees (Saskatchewan, Summerberry, etc.) and in both Wildlife Management Areas. Scattered occurrences are found in the Grand Rapids area along P.T.H. 391 and along the north shore of Lake Winnipeg.

The principle limiting factor in deer distribution in northern Manitoba is climate. A combination of deep snow and very cold winter temperatures serves to severely limit their range. A lack of the right combination of suitable vegetation and landforms as well as excessive soil moisture also restrict the spread of the whitetail.

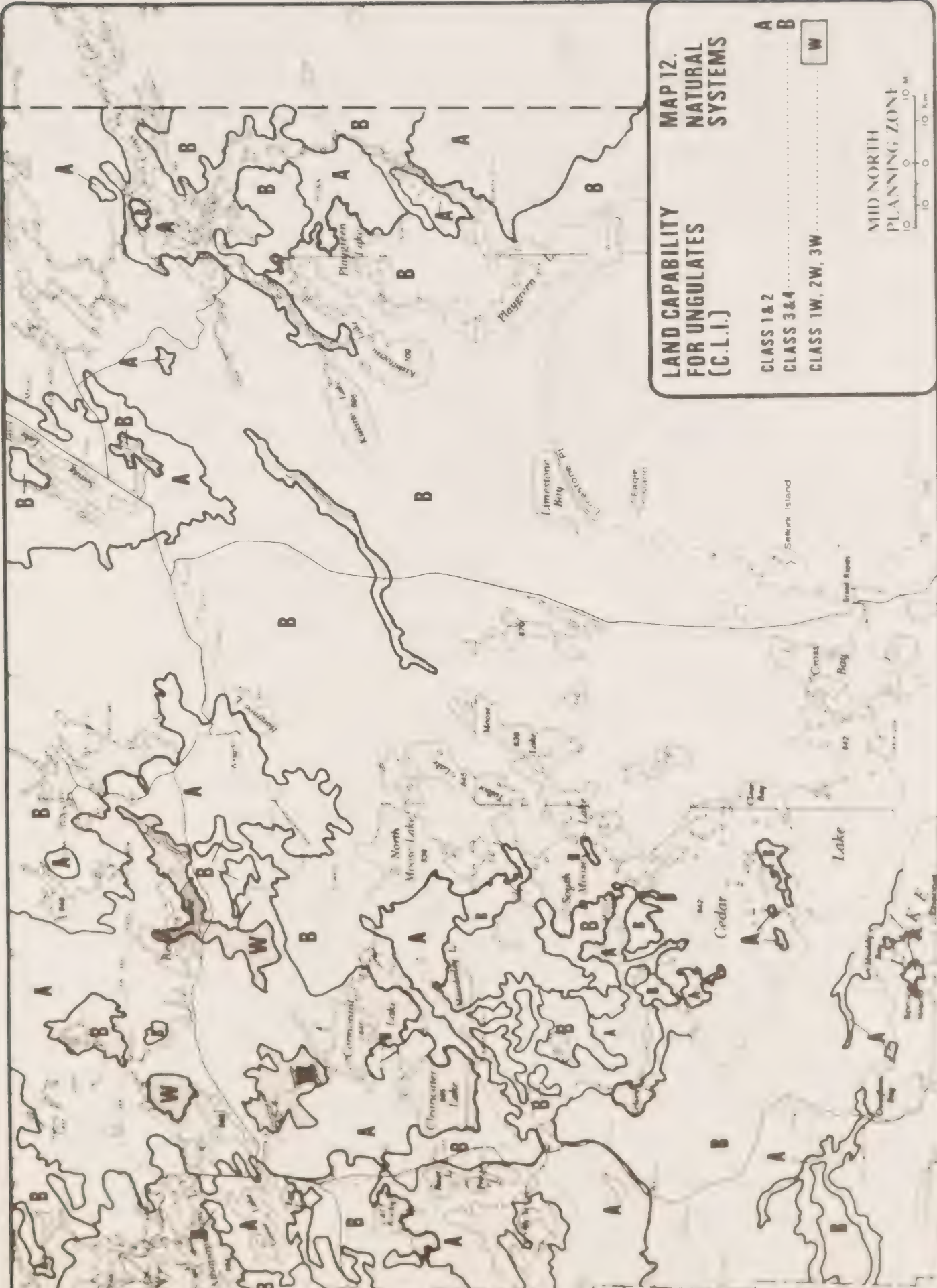
Moose is the most common and largest ungulate in the Planning Zone. It ranges in density from negligible populations to 2.9 per square mile.⁵ The highest moose densities occur in the Saskatchewan River Delta and the Red Deer Lake area.⁶

The Saskatchewan River Delta is highly productive moose habitat due to its large variety of vegetative types including shallow lakes and swamps (with submerged and emergent aquatic vegetation) as well as upland forest areas (along streams and river levees). The Red Deer Lake area's high moose densities are a result of large scale burns in 1961 which has resulted in excellent moose habitat.

Localized populations also occur in Selkirk Island, the area east of Morrison Lake and the east shore of Moose Lake. Although moose occur throughout the Zone other areas contain considerably lower moose densities. Limitations to moose productivity (where they are limited) are extensive areas of bog and lack of vegetative and landform variety.

⁵ Hildebrand and Imrie, PLUP, 1975. p. 46

⁶ Ibid. p. 46



Moose are the most intensely managed ungulate in the Planning Zone. Hunting seasons have been manipulated in order to control densities. In addition, control of access by car, truck or snowmobile is used to control hunting. Hunter questionnaires, check stations and aerial surveys have been used to determine size, distribution and health characteristics of moose.

Woodland caribou range includes most of the Mid North Planning Zone.⁷ One area in which specific details of caribou distribution and numbers are known is in the southwest portion of the Zone studied by Pilot Land Use Planning Project (PLUP). Within the study area caribou populations were noted in 'the bog' area south of The Pas, an area north of Grand Rapids and the area south of Reed Lake. The Sherridon-Naosap-Reed Lake triangle and the Norway House-Kiskitto Lake locations have also been shown to support a number of caribou.

Caribou prefer mature and over mature spruce with lichen-moss ground cover, and are thus easily disturbed by habitat disruption. Caribou appear to be relatively sensitive to habitat modification whether resulting from fire, forestry operations or development.

Woodland caribou management in the northern region has been primarily limited to hunting licence quotas (about 95 licences issued on the average for Northern Manitoba). Caribou research is actively underway in the Cormorant-Reed Lake area. This research, involving aerial surveys, tagging and the use of radio transmitters is attempting to determine numbers, movements and to improve or develop adequate census techniques.

Barren-ground caribou although primarily inhabitants of the tundra area north of the Planning Zone once ranged (in winter) well into the central portions of the Mid North. Two herds range into the Zone, the Beverly Herd in the west and the Kaminuriak herd in the north and west. Herds occurred near the communities of Pukatawagan, Nelson House, Ilford, South Indian Lake, Brochet and Cross Lake in the past. Although the caribou have in the past ranged as far south as Cross Lake and Nelson House, they now seldom move south of Reindeer Lake in the west and the

⁷ Banfield, 1974

Churchill River in the northeast. In fact the Kaminuriak herd has not been south of the Seal River in the last four years.⁸ They do not summer in the Planning Zone. Current winter range is shown on Map 13.

Reserach is currently underway by the Canadian Wildlife Service and the Department of Natural Resources (out of Churchill) in attempts to determine population dynamics.⁹



MAP 13. NATURAL SYSTEMS

BARREN-GROUND CARIBOU APPROXIMATE POTENTIAL WINTER RANGE

KAMINURIK HERD 
BEVERLY HERD 

Source; R. Larche, personal communication

⁸ Payne, H. Personal Communications

⁹ Referring to the Provincial Department of Mines, Natural Resources and Environment

Special Areas

In recent years, Canadians have become increasingly sensitive to the quality of their natural environment and the need for its preservation. Increased economic and technological developments have already destroyed much evidence of the natural and human history of Manitoba. In response, the Federal and Provincial governments have passed legislation to protect special components of the environment. At the provincial level, the Historical Sites and Objects Act, Crown Lands Act, Parks Act and Wildlife Act all contain clauses concerning the preservation of natural and cultural elements. Federally, the Migratory Birds Convention Act concerns itself with the protection of certain avian species.

Archeological Sites

An inventory of archeological sites in northern Manitoba was initiated in 1969 by the proposed conversion of Southern Indian Lake into a holding reservoir as part of the Nelson River power project. The Churchill River Diversion Archeological Project (funded jointly by Manitoba Hydro and the Provincial Government) was organized to locate and research archeological sites on the diversion route below Leaf Rapids. During the period 1969-1972, 191 sites were recorded.

As evidenced by Table 1, the proposed increase in lake level (about 11 feet) would flood 71 percent of the ancient fishing camps and settlements traditionally found at the water's edge.

It has been estimated that there are about eight thousand sites on Southern Indian Lake.¹ However, only a small portion of the cultural heritage of this area has been investigated. From the artifacts that have been discovered it appears that the early northern peoples had a certain level of sophistication in their equipment and fishing methods.

¹Leo Pettipas, personal communication

Table 1
Elevation Of South Indian Lake Archaeological Sites

Elevation	Historic ^a	Prehistoric			Undeter- mined	Total	Percentage
		Late ^b	Middle ^c	Early ^d			
0-5 ft.	6	87	1	1	21	116	60.7
6-10 ft.	4	5	1	-	3	13	6.8
11-15 ft.	2	4	-	-	1	7	3.6
16-20 ft.	1	2	-	-	1	4	2.0
20 ft.	1	1	-	-	-	2	1.0
Undetermined	3	33	-	-	13	49	25.6
Total	17	132	2	1	39	191	99.7

Source: Dickson 1972

^a1700 A.D. - Present

^b500 B.C. - 1700 A.D.

^c4000 B.C. - 500 B.C.

^dBefore 4000 B.C.

The clear impression of mesh fish net was found on a small pottery jar, suggesting the use of gill nets (an efficient method of fish harvest). Stone weights used in conjunction with fish nets were found at the Notigi Lake site. Stone and woodworking tools recovered from the Wapisu Lake site may indicate that this place was used by the early people as a canoe building place.

Apart from the artifacts uncovered by the project, a number of pictographs or rock paintings were also located. Representations of animals and mythical gods were often painted on rock faces along rivers, streams or gathering places. Of the three sites located on the Churchill River below Leaf Rapids the pictographs at site A (Map 1) are the most discernable. Two of the paintings on the rock face are stick figures of caribou, one of which is partially encircled. The paintings at this site were about six feet above the water level. Two more sites were located upstream. The first consisted of two thunderbirds flanking a head, a pipe being beneath one of them. The second, consisting of a single thunderbird with two oval dots above it, is about nine feet above the water level.



ARCHAEOLOGICAL SITES

- 1 - HARBOUR BAY CERAMIC SITE
- 2 - HARBOUR BAY NON-CERAMIC SITE
- 3 - TRAILRACE BAY
- 4 - PINE BLUFF
- 5 - MILL ISLAND
- 6 - THE PAS
- 7 - LAKE SITE
- 8 - BIG EDDY
- 9 - PROSPECTOR

10 - THE PAS INDIAN RESERVE

11 - THE PAS INDIAN BAND
— KNOWN ARCHAEOLOGICAL SITES

PICTOGRAPH SITES

- A - CARIBOU NEST
- B - FACE SITE
- C - OIL DRUM
- D - WISAKICHAK'S FOOTPRINTS

MAP 1. SPECIAL AREAS

MID NORTH
PLANNING ZONE

1 inch:40 miles

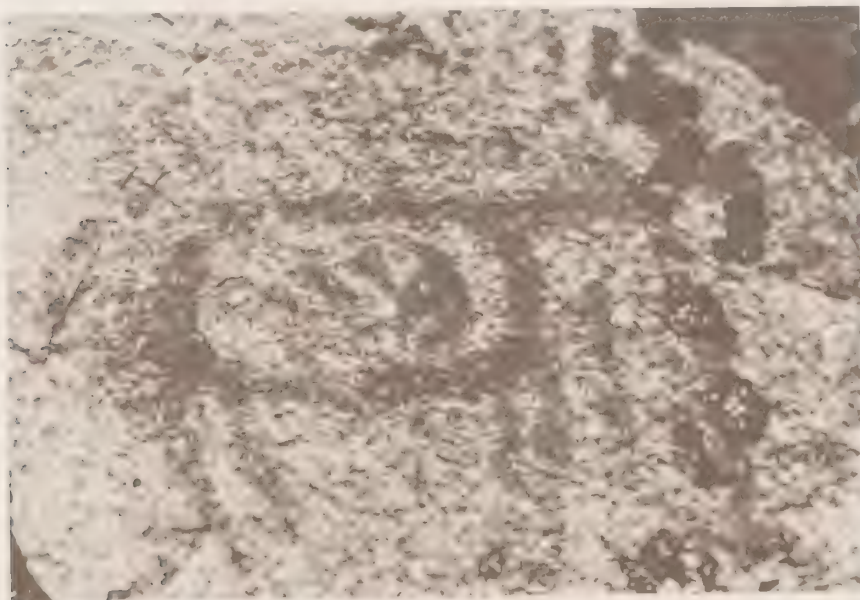
Pictographs have also been charted at Kipahigan Lake, Paimusk Creek, Eschimaish-Nelson River junction and Tramping Lake. Figure 1 is an example of a pictograph located along the shores of Tramping Lake.

Near the community of Nelson House, peculiar indentations in the bedrock were located. The local people refer to these indentations as the footprints of Wisakchak, the traditional cultural hero of the Cree.

At the present time there are two organizations concerned with the preservation of archeological resources in Manitoba: the Manitoba Archeological Society and the Historical Resources Branch of the Provincial Department of Tourism, Recreation and Cultural Affairs. The professional concern to preserve the native northern heritage has resulted in the recording of many sites.

The program of investigations by the Historical Resources Branch for the summer of 1976 encompassed a preliminary survey of the Tyrell Beach Ridge in anticipation of the proposed highway development between Gillam and Churchill. The right of way of the Easterville highway was also surveyed for potential archeological sites.²

² Because of the non-renewable nature of archeological sites, provincial archeologists are anxious to be involved in the planning process.



Ecological Sites

Preservation of areas of the natural environment was considered by the International Biological Program (IBP) in the mid 1960's. One of the more important activities of the IBP was the Conservation of Terrestrial Communities (CT). The purpose of the program was to identify and preserve samples of biological systems for the purposes of ecological education, scientific research and management, and to use the areas as baselines for assessing human impact on the world.

From conception to 1972-73, 600 thousand dollars had been provided by the National Research Council for ecological inventories. Environment Canada, Department of Indian and Northern Affairs and other federal agencies have provided support in the way of funds, transportation and professional services.

An Ecological Reserves Committee was established in Manitoba in 1974 to continue the investigations of the IBP. In May 1976, the Minister of the Department of Renewable Resources and Transportation Services announced the designation of Reindeer Island (Lake Winnipeg) as Manitoba's first ecological reserve. All resource harvesting and management activities have been prohibited within the designated area.

Ten proposed reserves (IBP) occur within the Mid North Planning Zone (Map 2). Table 2 lists the sites which have been submitted to the Department of Renewable Resources for designation as Ecological Reserves. These sites presently have no legal status and lack statutory protection at this time.

The Red Rock Lake site is one of two which had been given priority by IBP to become established as an ecological reserve. The site contains eight major types of plant communities. Shallow ponds and lakes support submerged meadows and emergent marshes. Higher and slightly drier areas are dominated by willow and alder species while Manitoba maple and green ash inhabit moist areas along small streams. Pure stands of aspen occur on recent burn sites. Mixed woods (birch, aspen, balsam fir and white spruce) are found along some river banks and almost pure stands of conifers (white spruce and balsam fir) occupy the higher, better drained sites and former stream levees. This IBP site also contains the northern most occurrence of bur oak in the province. The lakes and ponds located within the 20 square mile site provide staging and breeding grounds for a variety of waterfowl. CLI capability indicates the area to be very important for waterfowl production (Map 3).

MAP 2. SPECIAL AREAS

Mid North Planning Zone

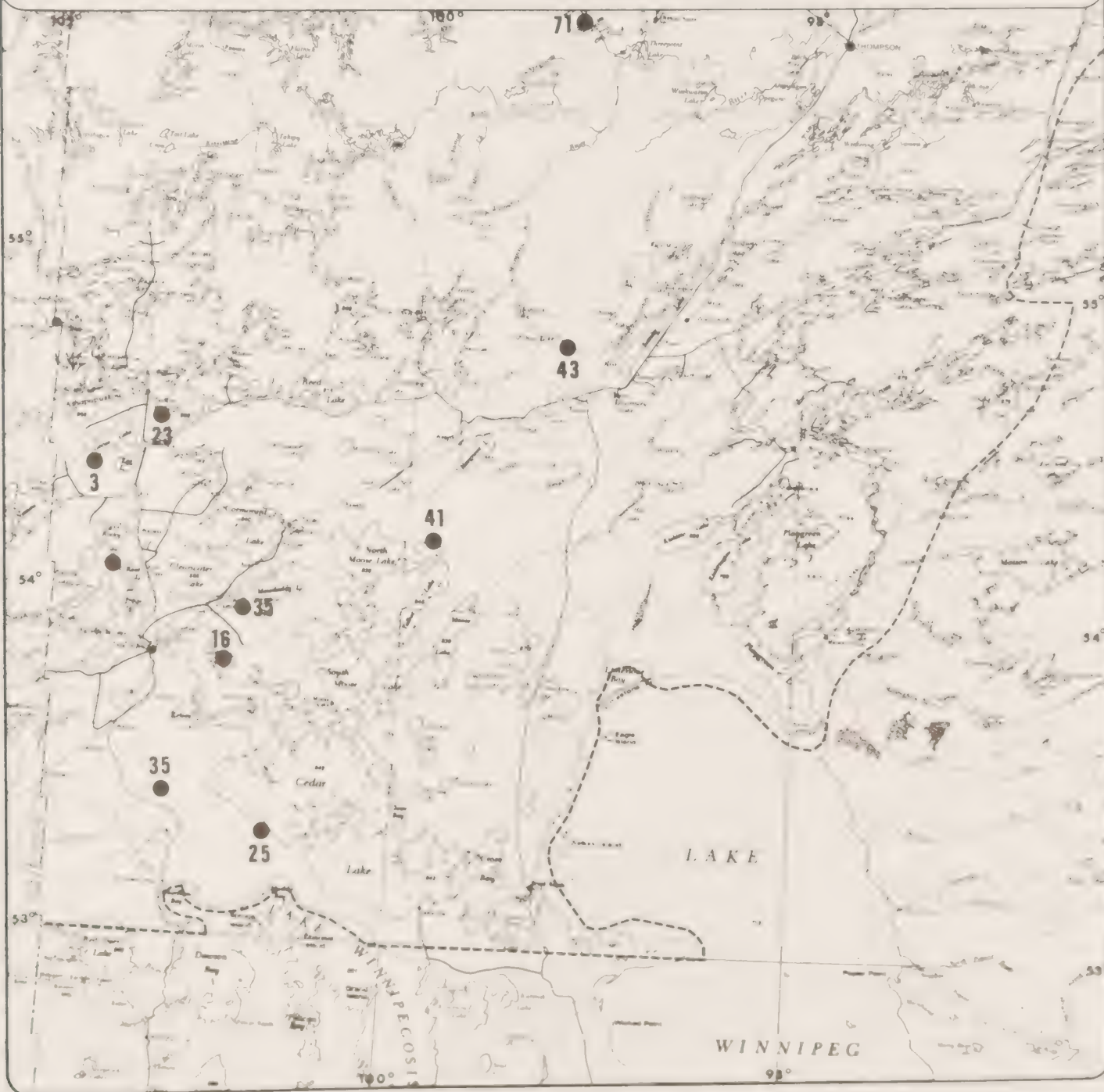
INTERNATIONAL BIOLOGICAL PROGRAM SITES

PROPOSED I.B.P. SITES ●

NUMBERS REFER TO TABLE 2

Miles 10 0 10 20 30 40

Source: Manitoba Conservation of Terrestrial Ecosystems
Subcommittee, 1972.



The second priority site, Palsa Hazel, is located within the Grass River Provincial Park and is thereby partially protected under the Provincial Parks Act. However, the area has been inventoried and shown to have moderate forest capability and merchantable timber stands.³

It is therefore in some danger of disruption by logging activities.

The IBP recommended:

1. That the palsa and small buffer zone around it be preserved for scientific purposes by preferential zoning within the Park, and
2. That any resource encumbrances on the area, such as timber leases be removed by the Department of Renewable Resources after consultation with the leasee.⁴

³ Forests of Manitoba 1974

⁴ Johnson, 1972

Table 2

Mid North Zone Sites Recommended For Ecological Reserve
Status By I.B.P. (Sept. 1972)

Site Name	IBP-CT #	Land Designation	Area (Square Miles)	Primary Reason for Recommendation
Atik Jack Pine	3	Undesignated Crown Land	3	Typical nearly mature (50 to 60 years) Jack Pine forest on limestone ridge.
Rocky Lake-Root Lake	26	Undesignated Crown Land & Saskeram Wild, Manage. Area	36	Moist upland White Spruce forest with extremely old and large trees.
*Red Rock Lake	25	Undesignated Crown Land	20	Vegetative diversity and good representation of typical Saskatchewan Delta plant and animal communities.
Landry Lake Island	16	Tom Lamb Wildlife Management Area	2	Undisturbed White Spruce-Balsam Fir Forest nesting bald eagles.
Balsam Fir Area	33	Tom Lamb Wildlife Management Area	4	Undisturbed, nearly pure stand of Balsam Fir.

ADDITIONAL SITES FOR ECOLOGICAL RESERVES

Moose Lake Peninsula	41	Undesignated Crown Land	.8 (530a)	Bald eagle, woodland caribou, great grey owl, diversity of fish.
White Forest Rapids	43	Undesignated Crown Land	.11 (70a)	Undisturbed mixed wood forest, bald eagle, caribou, great grey owl.
Wapisu Lake	71	Undesignated Crown Land	144.0	Large clear lake and rivers, boreal forest communities.
White Gedar	35	Undesignated Crown Land	.08 (50a)	Northern most stand of white cedar known in the province; glacial end moraine ridge.

SITES PROPOSED FOR CLASS 1 (SPECIAL AREA) STATUS WITHIN PROVINCIAL PARKS

*Palsa Hazel	23	Grass River Prov. Park	1	Permafrost peat landforms (palsas)
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*Priority Sites.

Wildlife Areas

Within the Mid North Planning Zone there are a number of areas which are critical to the survival of certain wildlife species. Map 3 outlines some of these areas.

The northwest corner of the Zone is a wintering area for the Beverly barren-ground caribou herd.⁵ Approximately 70,000 animals dependent on the black spruce forest to supply food for the herd is an important food source for the residents of Lac Brochet, Brochet and Tadoule Lake. Personnel from the governments of Manitoba and the Northwest Territories are presently monitoring the herd. Failure of the herd to migrate into Manitoba in recent winters has caused many hardships for the local people. Food supplies were air lifted into Brochet by the Department of Indian Affairs in 1976 and 1977.

Wolverine, now considered rare are also located primarily in this area.⁶ The specie is classified as a furbearer in the Wildlife Act (1963) and has occasionally been trapped as far south as the summerberry fur block (See Wild Fur Section). Apart from its designation as a furbearer the wolverine is not protected.

Golden Eagles have been known to nest in the Cochrane River area. Nests which may be up to five feet in diameter are usually located on inaccessible cliffs along streams. It has been estimated that there are only 12 eagles in the province making this area critical to breeding.⁷ Eagles are protected under the Wildlife Act.

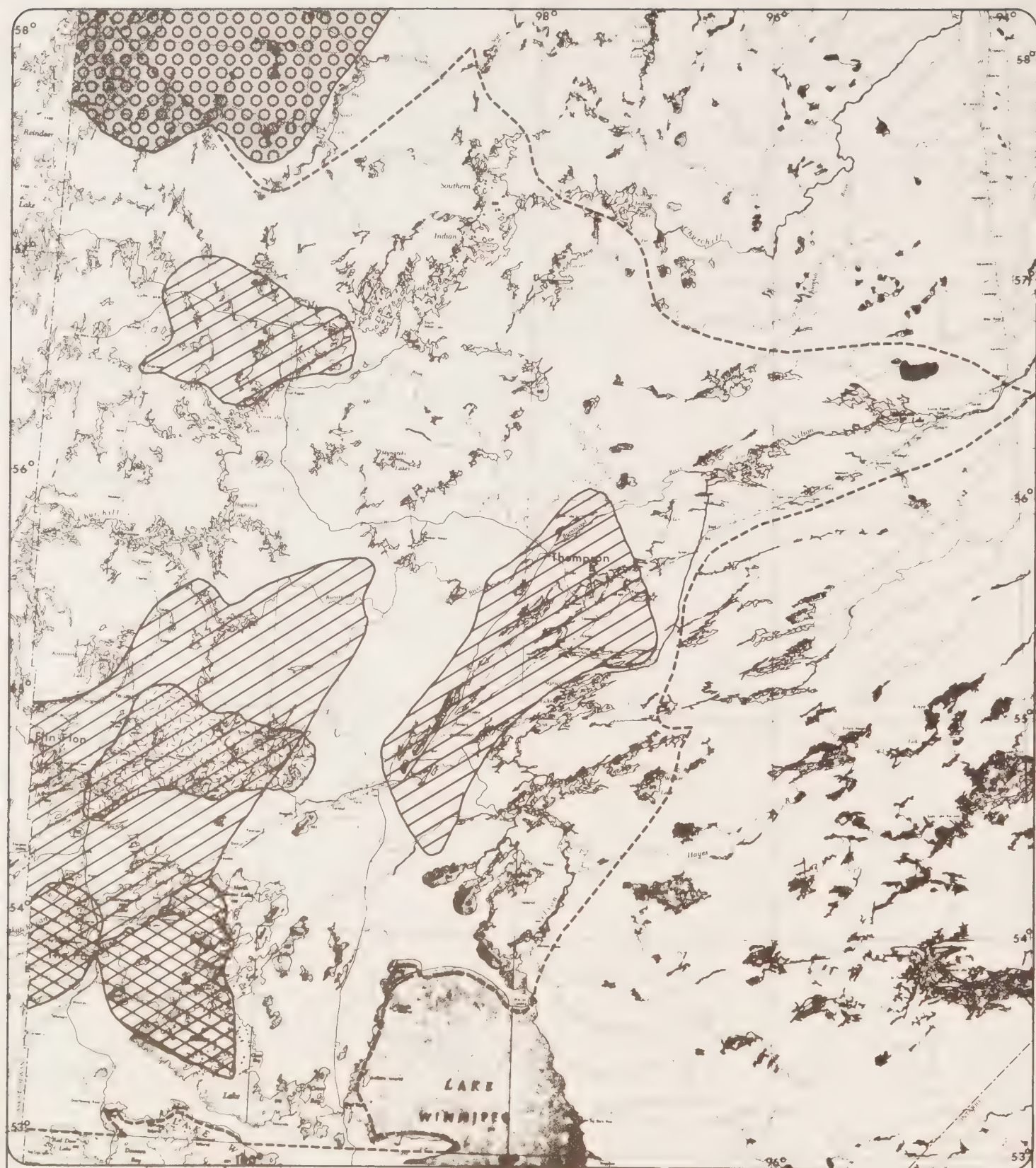
Pergrine falcons are considered endangered and are protected under the Wildlife Act. High sharply sloping escarpments near Little Limestone Lake north of Gillam, provide nesting habitat for these birds. Since nests are used annually by the same falcons, disturbance or destruction of nesting habitat or nests could have serious affects on the population. This area is therefore probably critical to the survival of the specie in the Zone.

Woodland caribou calving grounds have been located in the area of Reed Lake. Ongoing research by the Department of Renewable Resources in this area should provide the necessary information for the development of a management plan.







⁵Larche, 1972

⁶Van Zyll de Jong C.G., and Nero, R., 1971

⁷Ibid



CRITICAL AND IMPORTANT WILDLIFE AREAS

- CARIBOU WINTER RANGE (BARRENGROUND) 
- CARIBOU CALVING AREAS (WOODLAND) 
- MOOSE RANGE 
- GOLDEN EAGLE YEAR-ROUND RANGE 
- PEREGRINE FALCON NESTING SITE 
- WATERFOWL STAGING AREAS 

MAP 3.

SPECIAL AREAS

MID NORTH
PLANNING ZONE

1 inch:40 miles

Vegetative variety in the Saskatchewan River Delta (specifically the Saskeram and Tom Lamb Wildlife Management Areas) provides some of the best moose habitat in Western Canada. Densities have been estimated as high as 2.9 moose per square mile in some areas. Increased accessibility to the area and the use of snowmobiles has resulted in increased hunting pressure on moose populations. Manipulation of hunting seasons, road access and habitat by the regional biologists in conjunction with annual surveys are the methods employed for management of moose in the Zone.

A number of small lakes in the Zone are designated trout waters (Table 3) and as such certain regulations are placed on their use. Power boats are restricted for angling but can be used for various other recreational activities such as water skiing. Seasons and limits are manipulated in order to maintain numbers.

Table 3

Designated Trout Waters In The Mid North

Amulet Lake
Borrow Pits (between overflowing River and The Pas on P.T.H. # 10)
Kormans Lake
Mid Lake
Newman Lake
Scotty Lake

Natural Lake Trout Waters

Athapapuskow Lake Clearwater Lake

Power Boat Restrictions

Amulet Lake
Beaver House Lake
Borrow Pits (between overflowing River and The Pas on P.T.H. # 10)
Kormans Lake
Mid Lake Scotty Lake
Murray Lake Leaf Lake
Newman Lake Crater Lake

Apart from the floral and faunal special areas there are a number of recreational and historical sites which should be considered in the discussion of special areas. Scenic and aesthetically appealing sites within provincial parks and recreation areas have been so designated to protect the natural environment. The Provincial Park Branch controls these sites. Provincial Parks are also inventorying other sites which may need protection.

Historical waterways travelled by the early fur traders hold many points of interest for adventuring canoeists. Remnants of trading posts and trapper's cabins are found along the Middle Track Hayes River corridor.⁸ Numerous rapids and falls dot the twelve hundred mile route.

The Mistik Creek and Grass River Canoe Routes have been inventoried by provincial parks. Points of interest and aesthetic sites were identified and mapped.

Byways and Special Places Program (Parks Canada) are considering the Saskatchewan River as an historic and scenic water route.

Summary

Special areas in the Mid North might be summarized by the following points:

1. Archeological sites along the Churchill River, Southern Indian Lake Areas were surveyed in the early 1970's but investigations in other areas have not as yet taken place.
2. Examination and identification of possible ecological reserves in the north was carried out by the I.B.P. program. An evaluation of this program for future additions or deletions is probably necessary.
3. Information on areas of significant wildlife habitat is limited. The only areas extensively surveyed being the Saskeram and Tom Lamb Wildlife Management Areas.

⁸ Bernard, R. Middle Track and Hayes River Route. Tourism Recreation and Cultural Affairs, 1974.



Resources

Wild Fur

The trapping industry is probably Manitoba's oldest commercial activity. In 1935, after increased trapper pressure had reduced furbearer populations to new lows, the Summerberry Fur Rehabilitation Block was initiated. This was followed by the successful Registered Trapline System (RTL). This system was aimed at a planned fur harvest and attempted to encourage conservation practices. The fact that disputes (particularly boundaries) were left to the individuals to resolve, in the long run became one of the strong points of the system. In 1945 a provincial Order-in-Council designated the recommended areas as registered trapline sections. Trapping seasons and issuance of licences are controlled by the Department of Natural Resources.

Production

The Mid North Zone accounts for an average of 29 percent of the total Provincial wild fur production. This represents an average of 28.9 percent of the total wild fur value in Manitoba in the last five years. There are 20 registered trapline sections (Map 1) all or partially within the Mid North Planning Zone. Grand Rapids, Red Deer/Shoal River, Norway House, Cross Lake, Pikwitonei, Split Lake, Brochet and South Indian Lake sections are those which are split between the Mid North and at least one other planning zone. Split sections have been broken down on a block basis and those blocks falling as nearly as possible within the Zone were included in the Zone statistics.¹ Thus, data given for Mid North production are based on 13 full sections and seven partial sections.²

¹ Except Grand Rapids which is included in its entirety and Red Deer/Shoal River of which 1/3 of total production was used due to a lack of block data.

² Pikwitonei Section : all blocks except 20-22, 38, 52, 53
South Indian Lake : all blocks except 12-14, 16-19, 26, 37-41, 49, 50
Brochet Section : blocks 1, 2 and 13
Cross Lake Section : all blocks except 1, 6-8, 15, 19, 28-31, 55
Norway House : all blocks except 1, 7, 16, 18, 21, 24-26, 28, 31, 22, 26, 39
Split Lake Section : all blocks except 2, 54, 58-62, 64, 71, 74
Red Deer/Shoal River: 1/3 of total harvest



During the years in question (1964/65 through 1976/77) the Zone's fur production hit a low of about 63,000 pelts in 1971/72 and a high of nearly 170,000 in 1975/76 (Figure 1 and Table 1). This dramatic rise in production was primarily in muskrat which comprises 55 percent of the zones harvest (Table 2).

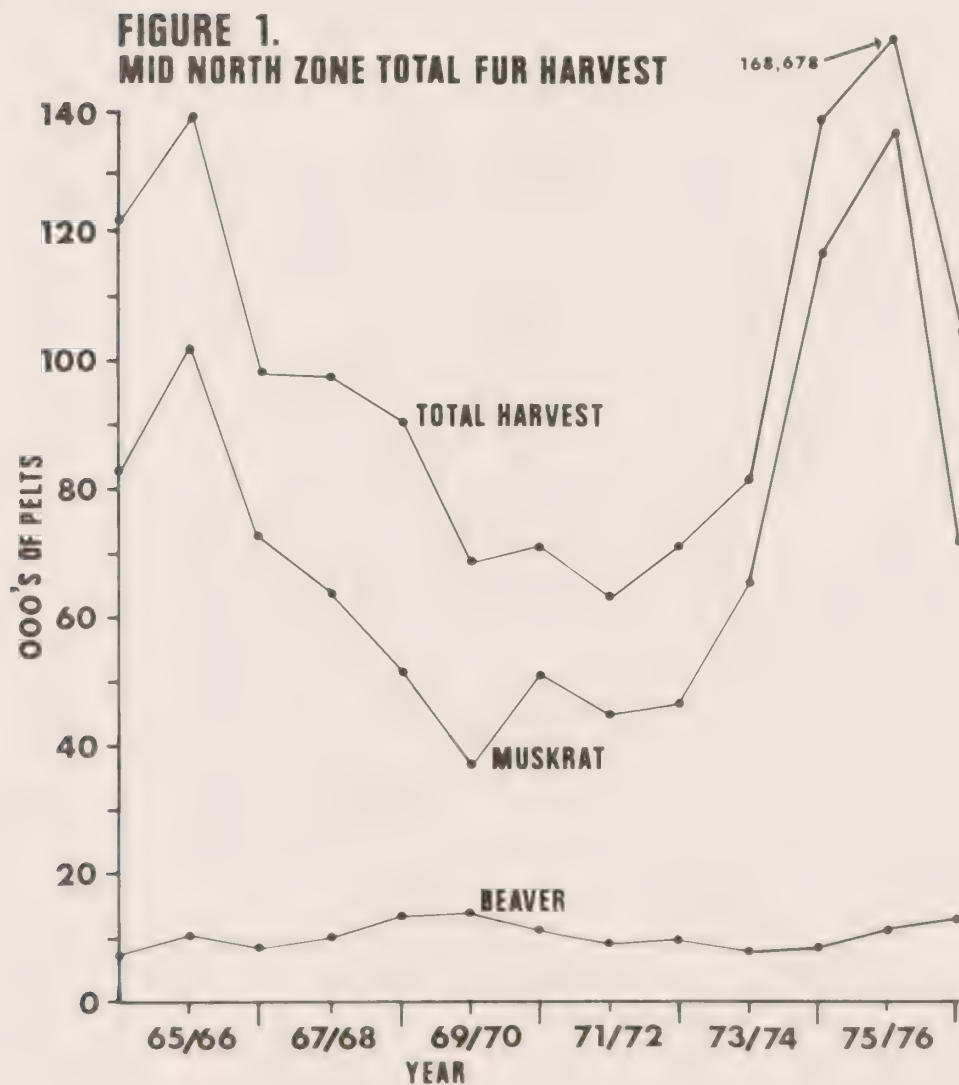


Table 1

Zone Wild Fur Harvest

	1976/7	1975/6	1974/5	1973/4	1972/3
Muskrat	71,600	138,055	118,175	66,800	51,849
Beaver	12,851	10,845	9,335	9,472	11,868
Squirrel	7,518	9,998	3,818	2,668	2,759
Mink	4,834	3,872	2,634	2,658	3,856
Ermine	2,545	3,151	2,602	1,031	3,110
Lynx	1,136	550	374	468	1,458
Otter	1,153	1,227	979	598	970
Fisher	367	306	291	273	456
Martin	206	42	24	76	22
Wolverine	25	14	30	40	50
Timber Wolf	72	54	73	61	80
Coyote	283	221	256	476	414
Red Fox	343	198	189	142	259
Other Foxes	335	89	251	46	100
Black Bear	39	56	105	99	97
Total	103,327	168,678	139,136	84,908	77,348
% of Provincial Harvest	15.2	40.8	39.9	36.0	12.4

Table 2
Percent Species Composition^a of Total Zone Harvest

R.T.L. Section	Beaver	Muskrat	Mink	Lynx	Ermine	Squirrel	Otter	Total
Split Lake	35.0	39.7	10.2	2.7	4.3	3.3	2.6	97.8
Norway House	9.3	73.9	5.4	1.2	3.0	5.0	1.6	99.4
Cross Lake	13.6	68.2	7.9	1.3	2.3	4.5	1.6	99.4
Pikwitonei	20.6	50.7	10.1	5.1	4.0	6.1	1.8	98.2
Thicket Portage	16.7	58.0	7.4	3.0	4.0	7.4	1.1	97.6
Pukatawagan	26.0	50.4	5.7	5.6	3.0	7.7	0.9	99.3
Nelson House	22.9	51.0	4.7	4.0	3.2	12.6	1.1	99.5
Cedar Lake (Easterville)	5.4	64.0	1.0	0.1	2.0	26.6	0.2	99.3
Sherridon	31.6	37.2	10.3	2.3	4.8	11.8	1.1	99.1
Herb Lake	16.6	50.4	5.8	4.1	5.0	16.0	1.5	99.4
Cranberry Portage	29.0	39.2	11.0	1.8	6.7	9.1	1.6	98.4
Wabowden	28.7	46.8	5.9	4.8	4.5	6.3	2.0	99.0
Flin Flon	33.3	42.4	12.8	1.5	4.0	3.6	1.1	98.7
Moose Lake	1.7	93.5	0.7	0.1	1.0	3.4	0.1	100.5
Cormorant	10.2	48.7	5.1	2.8	7.3	23.2	1.6	98.9
Brochet	10.5	31.0	15.1	0.9	7.1	28.8	3.8	97.2
South Indian Lake	16.6	58.5	6.6	1.8	4.7	7.0	0.9	96.1
Summerberry Block	1.1	93.9	0.9	0.1	1.5	2.3	0.1	99.9
Grand Rapids	11.3	62.7	2.7	0.8	2.6	17.9	0.4	98.4
Red Deer/Shoal River	6.4	44.9	1.7	0.3	3.4	42.2	*	98.9
Average	17.3	55.3	6.6	2.2	3.9	12.2	1.2	98.7

^a 15 year average

* Less than 0.1%

The Summerberry fur block is the single most productive trapping area in the zone from a pelts harvested standpoint.³ The block accounted for 34 percent of the total zone production in 1976/77 and 52 percent the previous year. The lowest productive trapping area has been the Cedar Lake RTL which has a ten year average of less than 500 pelts per year.⁴ The Summerberry fur block also displayed the best efficiency, averaging 200 pelts per trapper in the last ten years. The least efficient was the Split Lake RTL which averaged only 32 pelts per man.

The number of trappers in the Mid North has increased in the last few years and was nearly 20 percent over the ten year average in the 1976/77 season. Trapper effort hit a ten year high in the 1975/76 season, but was well below the average the following season (Table 3).⁵

Table 3

Season	Value to the Trapper by Season			Value Per Trapper (Dollars)
	Total Value (Dollars)	Number of Trappers ^a	Pelts Per Trapper	
1976/7	1,166,124	1405	73.5	829.98
1975/6	1,082,919	1377	122.5	786.43
1974/5	624,922	1170	118.9	534.12
1973/4	550,357	1085	78.3	507.24
1972/3	694,926	1097	70.5	633.48
1971/2	466,973	1134	60.7	411.79
1970/1	373,029	1076	70.8	346.68
1969/70	575,587	1050	71.4	548.18
1968/9	703,600	1212	80.2	580.53
1967/8	416,790	1164	98.6	358.07
Mean	665,523	1177	84.5	565.44

^aTotal trapping licences in Mid North Planning Zone

³Summerberry block includes the Moose Lake marsh, the Cormorant marsh, The Pas marsh and The Pas open area.

⁴See Appendix F for production by individual trapline section.

⁵Trapper effort, number of pelts per trapper.

Mid North Planning zone trappers represent about 14 percent of the provinces total trappers and about 50 percent of the provincial registered trapline trappers. The fur value for the 1976/77 season was 21 percent of the total provincial value and average trapper income (1976/77 season) of 830 dollars was higher than the provincial average of 482 dollars.⁶

Economics

The value of fur produced in the Planning Zone was nearly 1.2 million dollars for the 1976/77 trapping season.⁷ Over the past several years, the zones fur value has followed the trend set by the average fur prices⁸ as noted in Figure 2.

Muskrat, the most numerous specie is also the most valuable in total. Beaver, mink and lynx values when combined with muskrat value nets about 85 percent of the total zone value. Value by specie for the last five years is given in Table 4.

Individual trappers have benefited significantly by the recent high prices. Average value per trapper has more than doubled in the past ten years. In the 1975/76 season only 21 trappers in the zone produced fur worth 2000 dollars in value or more. The same season saw 749 trappers at less than 500 dollars. By comparison, 148 trappers exceeded 2000 dollars in the 1976/77 season while 656 were under 500 dollars. The average value per trapper in the Planning Zone for 1976/77 was 830 dollars. The average trapper income (value) per trapline section is shown on Figure 3.⁹ Note Pikwitonei section averages almost 1900 dollars per man, while Easterville is less than 300 dollars.

The income derived from trapping is small as a comparison of community income, although in some communities, such as those mentioned in Table 5, dependance on trapping is significant when 'income-in-kind' is included.¹⁰

⁶ Average of provincial open areas was 372.38 dollars. Average of provincial RTL trappers was 807.60 dollars.

⁷ Value determined by using average price per pelt F.O.B. auction.

⁸ Average prices include only those species caught in the Zone.

⁹ Trapper income per section includes all production and trappers for the whole trapline whether in the Planning Zone or not.

¹⁰ Income-in-kind is the domestic use of trapping e.g., eating the meat and using the fur for clothes.

FIGURE 2.
FUR VALUE AND AVERAGE FUR PRICES.

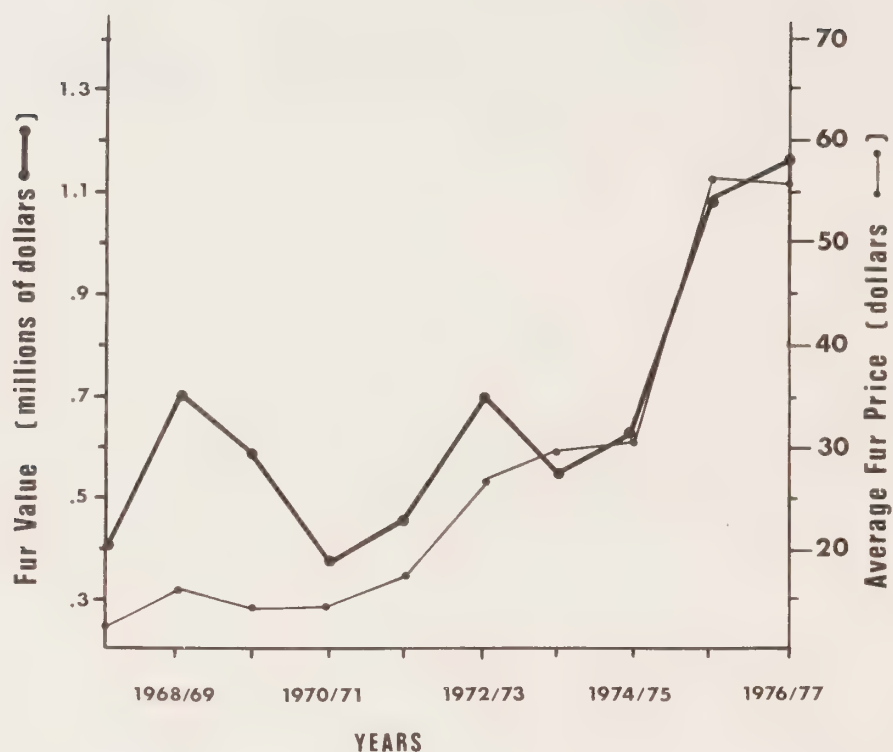


Table 4
Zone Fur Value^a by Species
(Dollars)

	1976/7	1975/6	1974/5	1973/4	1972/3
Muskrat	305,732	499,759	309,619	187,040	136,881
Beaver	275,268	216,900	143,199	184,704	237,953
Squirrel	6,014	6,999	2,405	2,001	1,380
Mink	113,937	100,672	34,584	58,476	90,230
Ermine	3,487	2,836	2,082	1,237	3,203
Lynx	274,594	141,350	46,006	42,120	131,439
Otter	68,938	73,620	35,587	22,515	38,490
Fisher	32,435	29,682	13,206	11,807	15,107
Coyote	16,451	12,376	9,449	18,516	12,412
Red Fox	19,544	8,514	5,834	5,566	7,615
Others ^b	49,724	19,893	22,951	16,375	20,216
Total	1,166,124	1,082,919	624,922	550,357	694,926
% of Provincial Value	18.9	33.0	24.2	19.8	19.1

^a Average price F.O.B. auction, Winnipeg.

^b Includes martin, wolverine, timber wolf, black bear, cross fox and white fox.

**FIGURE 3.
AVERAGE TRAPPER INCOME - 1976/77 SEASON.**

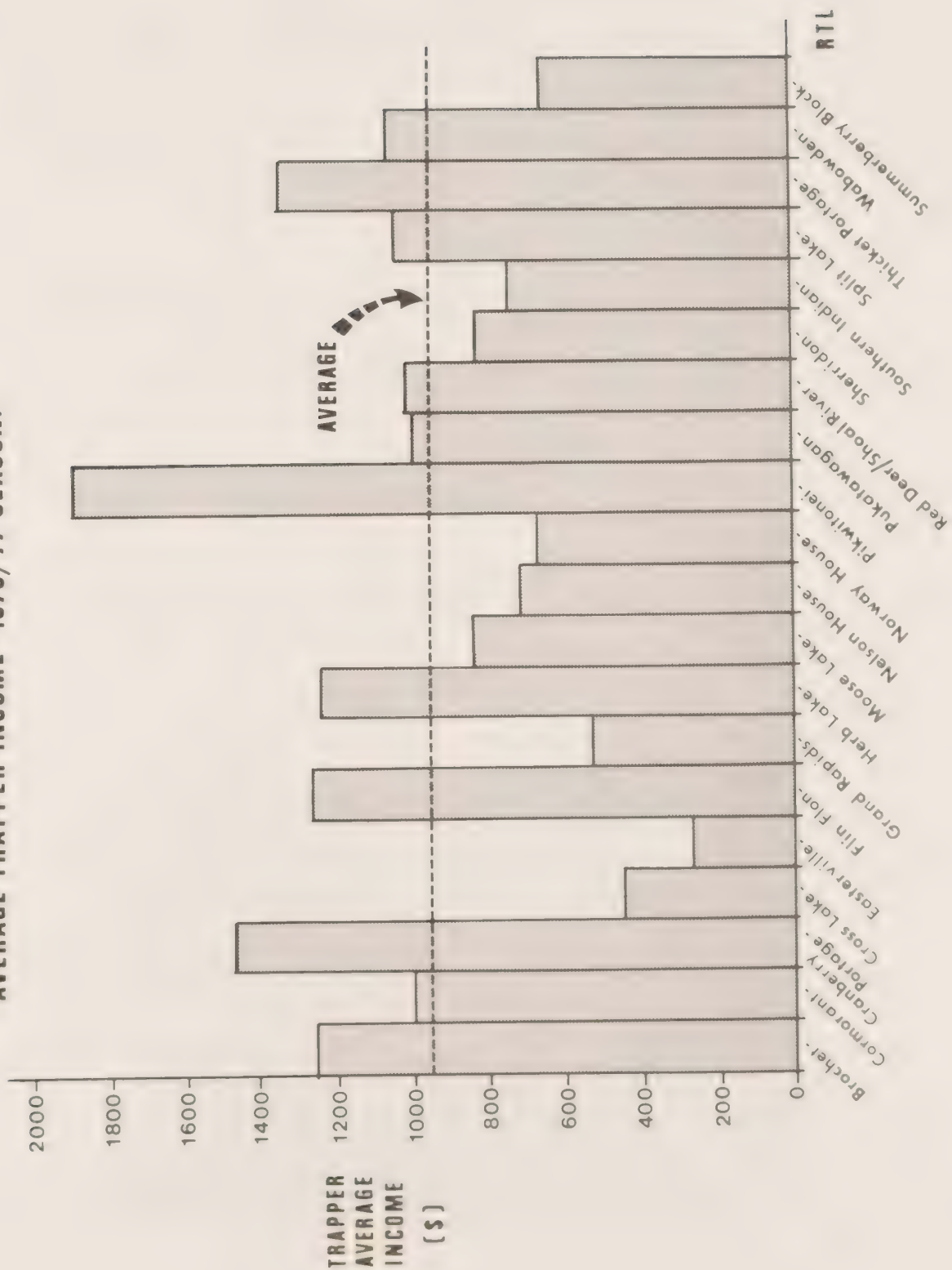


Table 5

Percentage of Community Income Derived from Trapping

Community	(Percent)	
	Cash	Income-in-Kind
Brochet ^a	1.9	0.0
Cross Lake ^b	1.0	1.0
Granville Lake ^a	5.0	4.0
Nelson House ^b	1.0	2.5
Pukatawagan ^a	3.5	4.7
South Indian Lake ^b	2.0	2.0

^aSource: Social and Economic Impact Study of the Churchill-Nelson Rivers Hydro Development, 1973.

^bSource: Churchill River Study. 1975

Wild Fur Program

In April 1975, the Manitoba Wild Fur Program came into effect. Its goal was to optimize the development and use of provincial fur resources and to maximize the social and economic benefits to trappers. The program is managed by the provincial government and an advisory board.¹¹ The project cost, over eight million dollars, in five years is jointly (Federal-Provincial) funded.

Under the program, marketing assistance is given to trappers. This ranges from market forecasting, production monitoring, fur depots to buyer negotiations.¹²

The Improved Biological Production component endeavours to evaluate and if necessary take steps to improve the production capability of an area. For example, nearly 85 thousand dollars was spent on improved biological production in the 1976/77 fiscal year. This expenditure resulted in the construction or improvement of ten dams, 3,300 feet of ditching and nine field surveys.¹³

¹¹The board consists of two members of the Provincial Government, two members of the Federal Government and three members of the Manitoba Trappers Association.

¹²Such as The Bay's policy of selling on consignment.

¹³Grower, 1978

Under the Advisory and Management Services component, fur managers are located in The Pas and in Thompson and between them oversee some 31 local fur councils. In addition to the managers, trapline officers are located in Cormorant, South Indian Lake, Wabowden, Brochet, Cross Lake, Nelson House, Pukatawagan and Split Lake.

Other areas of involvement for the Wild Fur Program include trapper education,¹⁴ the humane trapping program and fur market improvement.

Summary

Trapping is a traditional activity which has acted as an income supplement and partial food source. The commercial aspects of trapping, aided by the Wild Fur Program, appear healthy despite the changing northern life style. Production, total trappers, total value and average income are all generally up in recent years.

¹⁴In the 1976/77 fiscal year 12 trapping schools were held in the Mid North.



Fisheries Resources

The first commercial fishing in Manitoba occurred on Lake Winnipeg in the 1880's but two decades passed before it was successfully expanded into the Mid North Zone. The first northern fishing of this type occurred in The Pas area after the turn of the century. The industry gradually expanded in the next 50 years with Cross Lake and Southern Indian Lake fisheries starting during the early forties (although fisheries of a commercial nature occurred in Pukatawagan in the 1920's and in Brochet in 1912 significant production did not occur until the forties).

Initially the northern commercial fisheries were run by private entrepreneurs who employed native (predominantly Cree) workers. However, since 1960 there has been a significant shift in the administrative techniques with the appearance of local fishermen managed co-operatives. The Provincial Department of Co-operative Development has been set up in recent years to assist the co-operative operations. Private control of the commercial fishing was effectively ended in 1969 with the establishment of the Freshwater Fish Marketing Corporation (F.F.M.C.). This federal crown corporation, became the sole buyer for fish exported from the province.

Quotas

In the fisheries regulations,¹ 185 water bodies in the Mid North were eligible for winter commercial fishing (1976-77), 175 for the summer season (1976). The annual quota from these lakes is in excess of seven million pounds (See Appendix G). For example in the summer 1976 season 7,050,000 pounds quota was available for commercial fishing. The quota production for that season was 63 percent for those lakes where fishing was attempted, but only 39 percent of the zones total quota for all lakes eligible. The average percent quota² filled

¹ Fisheries are under the jurisdiction of the Federal Government and Fisheries regulations are published in the Canada Gazette. The Manitoba Department of Renewable Resources is responsible for enforcement and administration of these regulations.

² Average quota for years fished i.e., a lake fished 10 out of 16 years would be averaged on the 10 years fished.

for those lakes regularly³ fished are shown on Map 1. A number of water bodies are frequently found to exceed their allowable quota. Small excesses of an infrequent nature are of course understandable. Map 2 shows those water bodies that have exceeded fisheries quotas by more than five percent in more than one season in recent years. The Saskatchewan River has been fished in 25 seasons in the period under discussion and has exceeded quota by more than five percent in 11 of them. Southern Indian Lake is ten seasons over quota for 30 seasons fished while Kiski Lake goes five percent or more over quota nearly 47 percent of the seasons fished.

Production

There are two types of production used in discussing fisheries statistics, quota production and total harvest. Quota production or harvest consists of the poundage sold⁴ for species listed on quota for each individual lake. Total harvest is the total poundage marketed, including quota and non-quota species.⁵ Total harvest generally exceeds quota harvest by about 16 percent in summer seasons and 23 percent in winter seasons.

Total harvest for the zone by season is shown in figure 1 and listed in table 1. The lakes of the Mid North Planning Zone account for the lions share of the northern fishery production. Mid North lakes yield some two-thirds of the northern harvest and about one-fifth of the total provincial production (Table 2).

The number of fishermen although down slightly from previous years (Figure 2) has not maintained any obvious declining trend as was seen in total harvest. The number of lakes fished per season has declined steadily since 1965 particularly in the winter season. The rate of decline of lakes fished in the summer season has slowed markedly since 1969 (Figure 3). The summer season averages 57 lakes fished and the winter season 49.

³Fished 12 seasons or more in the 32 seasons from summer 1961 to winter 1976-77.

⁴All harvest figures are in fact pounds sold or marketed and not necessarily pounds caught. Some fish may be thrown out, some eaten by the fishermen and some sold or bartered locally, thus actual harvest is usually higher than figures given.

⁵Production figures used are those provided by the Dept. of Natural Resources (See Appendix I)



AVERAGE % QUOTA FILLED

- A > 75
- B 50-75
- C < 50

(SEE APPENDIX G)

MAP 1. **FISHERIES RESOURCES**

MID NORTH
PLANNING ZONE



LAKES OVER-QUOTA^a (summer 61-winter 76-77)
NUMBERS REFER TO NUMBER OF SEASONS OVER-QUOTA

MAP 2.
FISHERIES
RESOURCES
MID NORTH
PLANNING ZONE

a. 5% over or more

FIGURE 1. TOTAL COMMERCIAL FISHING HARVEST

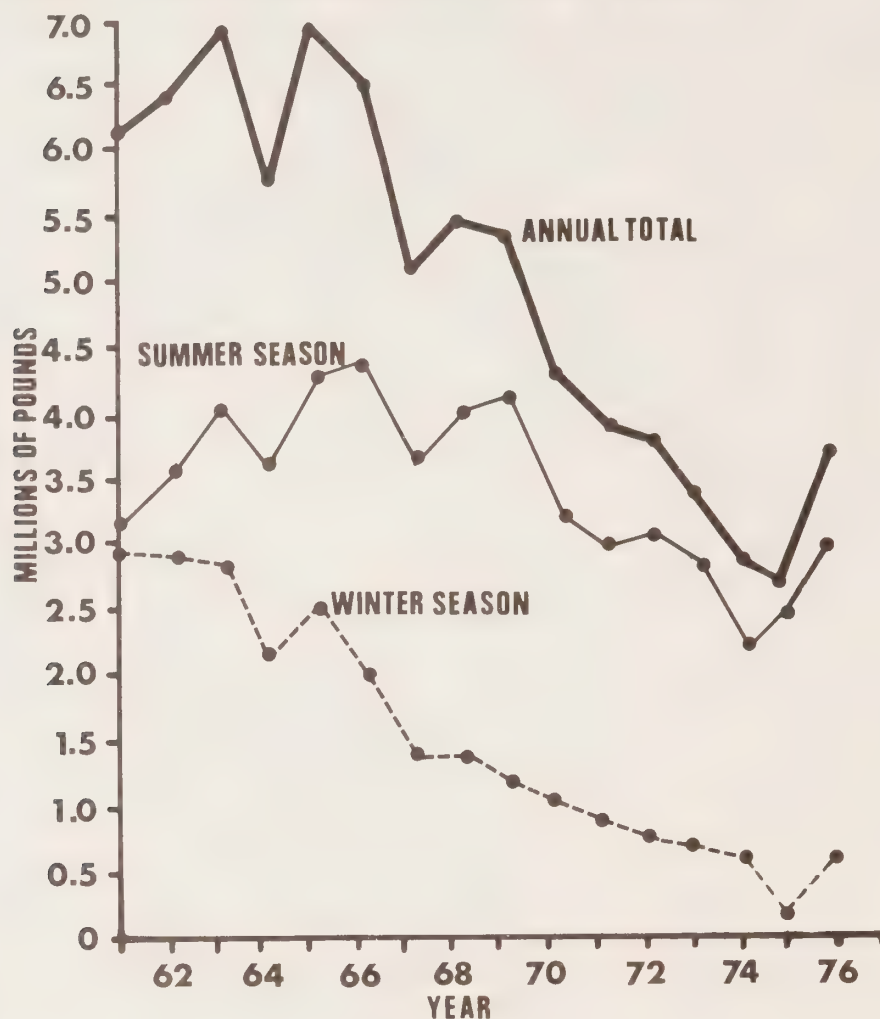


FIGURE 2. TOTAL FISHERMEN

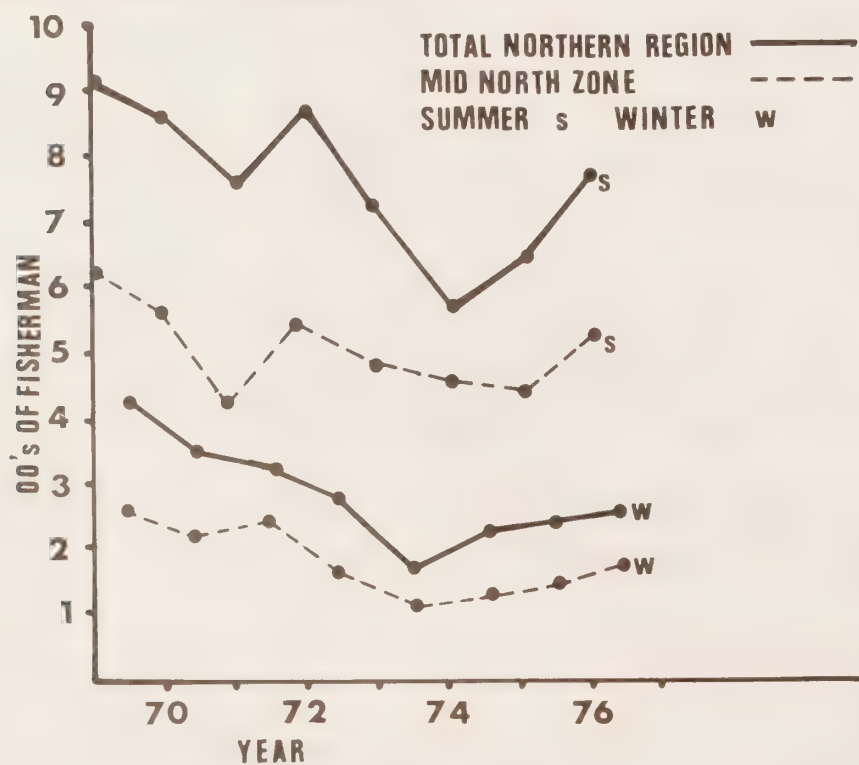


Table 1

Production By Species Mid North Zone (lbs)

Season	Whitefish	Pickrel	Trout	Pike	Tullibee	Goldeye	Other ^a	Total
W 76/7	339,149	133,655	888	122,973	45,459	344	14,258	656,726
S 76	1,693,011	875,250	18,264	330,922	187,829	11,829	4,999	3,122,104
W 75/6	25,031	62,263	1,106	47,177	59,874	1,397	17,859	214,707
S 75	1,437,680	584,580	5,933	281,503	116,541	12,946	45,259	2,504,442
W 74/5	216,084	179,036	4,991	131,512	82,758	1,673	36,053	652,107
S 74	1,115,617	581,511	65,539	292,954	124,519	15,506	48,434	2,244,080
W 73/4	148,625	171,761	4,540	131,518	47,130	1,990	22,819	528,383
S 73	1,920,318	535,228	42,366	318,584	50,405	2,536	342	2,869,779
W 72/3	389,939	154,527	4,878	85,491	22,205	0	36	657,076
S 72	2,083,020	646,311	226,085	221,100	21,565	11,630	683	3,210,394
W 71/2	448,453	239,148	3,551	229,565	18,723	4,052	3,911	947,403
S 71	1,662,460	896,550	80,820	285,712	25,396	4,528	10,014	2,965,480
W 70/1	509,193	291,051	5,359	241,563	14,444	1,034	2,070	1,064,714
S 70	1,866,596	778,303	82,441	313,536	4,621	9,180	4,638	3,059,315
W 69/70	606,366	210,704	10,379	296,594	99,125	405	60	1,223,633
S 69	2,272,408	636,964	249,970	648,340	302,834	32,409	71,329	4,214,254
Total	16,753,950	6,976,842	807,110	3,979,044	1,223,428	111,459	282,764	30,134,597
% of total	85.6	23.2	2.7	13.2	4.1	0.4	0.8	
W 76/70	1,047,172	436,053	50,444	248,690	76,464	6,966	17,673	1,883,412

^aincludes sturgeon, perch, sauger, mullets, maria

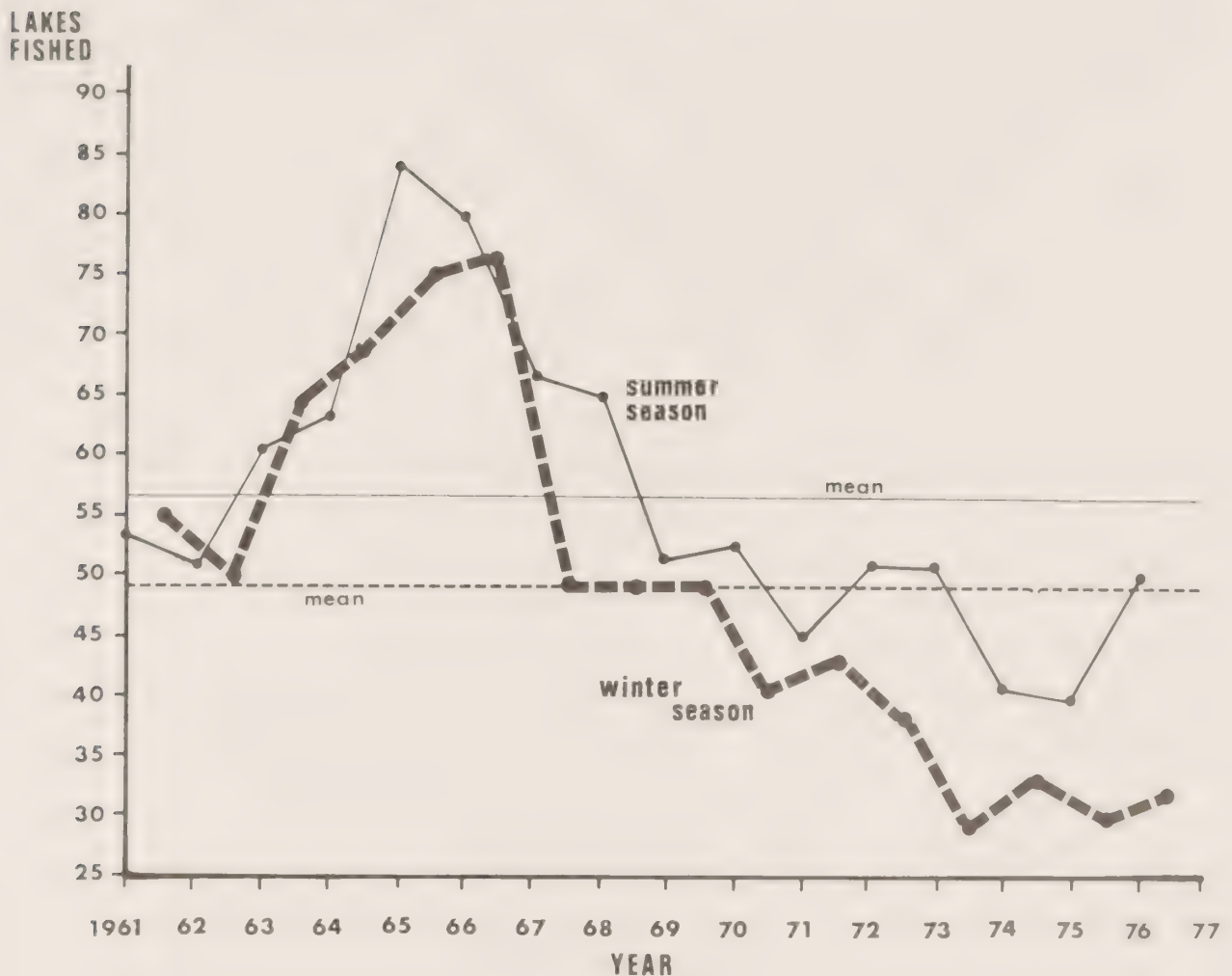
TABLE 2

Mid North Commercial Fishing Harvest
As a Percent of Provincial and
Regional^a Harvest By Species

Season	Whitefish		Pickerel		Trout		Pike		Tullibee		Total Harvest	
	Region	Province	Region	Province	Region	Province	Region	Province	Region	Province	Region	Province
W76/7	63.0	25.6	82.4	9.4	17.4	18.0	85.3	6.1	99.9	47.0	70.8	9.8
S76	64.1	41.0	74.7	20.5	86.8	86.8	49.7	19.2	99.4	62.2	66.3	25.1
W75/6	54.0	31.5	78.5	11.6	22.4	22.4	84.1	7.5	94.9	43.6	69.9	9.7
S75	57.7		68.5		54.3		42.7		89.4		58.9	18.2
W74/5	39.0	30.8	96.4	20.7	39.0	80.9	92.0	13.9	95.8	20.0	63.8	14.7
S74	71.5		82.5		91.6		67.2		90.6		74.4	
W73/4	89.0	24.0	85.8	19.0	45.9	75.9	90.0	14.6	99.2	18.1	88.7	15.8
S73	70.4		66.0		81.7		55.5		100.0		67.9	
W72/3	58.2	43.2	88.0	22.0	31.8	--	70.9	10.5	100.0	60.6	65.4	19.3
S72	64.6		64.3		86.6		29.4		43.3		62.0	
W71/2	65.6	46.0	95.2	57.9	24.3	--	95.3	25.6	77.5	80.8	77.5	30.6
S71	59.8		67.5		75.6		45.2		100.0		60.8	
W70/1	68.0	62.7	92.3	46.6	35.7	--	97.3	22.1	99.6	64.0	79.1	29.3
S70	61.6		66.9		76.8		48.8		98.7		61.5	
W69/70	48.7	53.3	86.3	30.4	18.7	--	76.3	22.3	88.4	53.5	59.8	25.4
S69	65.8		95.4		84.4		86.3		91.7		74.5	
Summer Mean	64.4	40.6	73.2	27.9	79.7	57.9	53.1	16.1	89.1	49.4	65.8	20.8
Winter Mean	60.7		88.1		29.4		86.4		94.4		71.9	

^aNorthern Region of the Department of Renewable Resources

FIGURE:3
NUMBER OF MID NORTH LAKES COMMERCIALY FISHED



Economics

With an average of just over 500 fishermen participating in the summer commercial fishery, this represents almost two percent of the estimated actual labour force for the zone. The winter fishery contributes about one half of one percent of the labour force.

The value of the catch to the fishermen varies by species composition, quality, size of catch and current prices. The 1976 summer season had a value to the fishermen⁶ of 1.1 million dollars.⁷

⁶ Commercial Fishing Report, Summer 1976, Northern Region, Department of Renewable Resources.

⁷ F.O.B. delivery point and excluding freight rate subsidy.

This represents an average of nearly 23 thousand dollars per lake and 22 hundred dollars per man. The 1976-77 winter season on the other hand had a gross vlaue⁸ to the fishermen of just over two hundred thousand dollars. This represents over 66 hundred dollars per lake and averages 1120 dollars per man.

Many lakes in the northern Manitoba fishery are economically borderline, they are operated at a loss or under subsidies and grants. The major factors in this situation are rapidly climbing transportation costs, equipment costs and operating costs. Less than efficient operations and management commonly jeopardize the economic viability of many operations.

In an effort to offset, in part, the dramatic rise in operating costs, the Department of Renewable Resources initiated in 1976 a freight assistance subsidy for licenced commercial fishermen. Individual subsidies by lake are listed in table 3 and those Mid North lakes eligible are shown on Map 3. The information available at this time is not sufficient to evaluate the effectiveness of this program.

The exact transportation network used in the northern fisheries varies from season to season, however an idea of the travel distances from the individual lakes to the intermediate delivery points may be gained by noting Maps 4 and 5.

Prices of fish have steadily increased since the marketing corporation was formed (Table 4). They have not, however kept up to the cost of living in the same period. For example medium sized continental standard whitefish prices have risen at an annual average rate of 5.4 percent while the cost of living for the same period (1970-1976) was 8.8 percent. Headless dressed pickerel averaged 5.6 percent per year and large dressed northern pike increased 3.5 percent per year. Tullibee prices, an exception to the other major species, has increased at over 21 percent per year.

⁸ Southern Indian Lake counting for 28 percent of this figure.

Table 3

Northern Thompson's Hought Assistant's letters

Item Number	Lake	Cents Per Lb.		Item Number	Lake	Cents Per Lb.		Item Number	Cents Per Lb.	
		Summer 1976	Winter 1977			Summer 1976	Winter 1977		Summer 1976	Winter 1977
Apeanau	8	-	10	Fish	107	-	-	Opachuanau	197	-
Armstrong	9	-	5	Flatrock	108	10	10	Paint	201	4
Baldock	14	10	10	Gauer	112	10	-	Partridge Crop	205	4 1/4
Barrington	16	7	8 1/2	Goose	117	1/4	1 3/4	Pikwitonei	210	6 1/2
Batty	17	9 1/4	10	Granville	119	4 1/2	7 3/4	Pipestone	211	6 1/2
BC-Anvil	19	-	4 3/4	Guthrie	121	10	-	Reindeer	222	8 3/4
Begg	25	5 1/4	-	Halfway	122	3	4	Russell	229	10
Brannigan	37	-	9 3/4	Herblet	127	4 1/2	-	Russick	230	-
Bruneau	41	1	4 3/4	Kipahigan	143	6 1/2	-	Sabomin	232	3
Brunne	42	-	3 3/4	Kiski	144	-	-	Saskatchewan R.	233	3
Buckingham	43	5 1/4	-	Kiskitto	145	2 3/4	-	Sipiwesk	245	1
Burntwood	46	10	10	Kiskittogisu	146	3 1/4	-	Sisipuk	246	-
Butterfly	47	10	10	Kiskeynew	147	3	-	Solomon	250	-
Cartwright	*	-	4 1/2	Kississing	148	4	5	Southern Indian	251	2 1/2
Chapman	55	-	10	Landing	153	2 1/4	-	Split	252	10
Clearwater	60	3	2 1/2	Landry	154	-	2 1/4	Stag	253	9
Cockerm	61	-	4	Laurie	155	10	-	Summerberry	257	3
Cormorant	65	1/2	3 1/2	Leftrook	158	10	-	Suwannee	258	-
Costello	66	-	5	Limestone Pt.	160	10	10	Tait	260	-
Cross	72	9 1/2	-	Loonhead	167	-	10	Takipy	261	-
Crow	73	-	8 3/4	MacBride	169	-	-	Talbot	262	4
Dolomite	82	-	6	Melvin	177	-	-	Three Finger	265	-
Dow	83	9 1/4	10	Moody	180	-	10	Walker	272	10
Drunken	84	-	3 3/4	Moose, North Arm	182	3	-	Wapisi	275	-
Duck	85	3	-	, East Arm	183	4	3 1/4	Waskaiowaka	278	-
Dugas	86	1 1/2	-	, Pick. Ch.	184	3	2 1/2	Wedge	282	-
Dyce	89	-	4 1/2	Mossy	*	-	-	Wekusko	283	-
Eden	91	-	6	Mynarski	189	-	-	White Rabbit	288	-
Egg	*	-	-	Natawahunan	191	4 3/4	8	Wintering	295	2 1/4
Election	95	-	3	Nelson River	192	10	-	Witchai	296	-
Fay	103	3 1/4	4 1/2	Notigi	195	-	-	Woosy	299	-
								Wuskwatim	300	6 1/2
								Yawninstone	301	-

Item numbers are those listed in the Canada Gazette Schedule XVI. Part VI.

*NOT LISTED IN REGULATIONS



**F.F.M.C. DELIVERY POINTS &
INTERMEDIATE DESTINATIONS
1976 SUMMER SEASON**

**MAP 4
FISHERIES
RESOURCES
MID NORTH
PLANNING ZONE**



**F.F.M.C. DELIVERY POINTS &
INTERMEDIATE DESTINATIONS
1976-77 WINTER SEASON**

**MAP 5
FISHERIES
RESOURCES
MID NORTH
PLANNING ZONE**

Table 4
Price to Fishermen F.O.B. Transcona^a

	1970	1971	1972	1973	1974	1975	1976	1977	Change
Whitefish ^b	.21	.21	.22	.22	.24	.24	.29	.29	+ 38
Pickrel ^c	.51	.51	.51	.51	.51	.54	.71	.85	+ 66
Tullibee ^d	.06	.06	.06	.06	.08	.10	.15	.17	+183.3
Northern Pike ^e	.16	.16	.14	.18	.19	.19	.20	.23	+ 43.8

Source: F.F.M.C. Price Lists

^aPrices for loose dressed fresh fish

^bContinental standard medium sized

^cHeadless medium sized

^dContinental medium sized

^eLarge sized



Forestry

Controlled use of forests appears to have started after the passing of the Dominion Land Act in 1872. After the turn of the century, two federal acts, the Forest Reserve Act (1906) and the Forest Reserves and Parks Act (1911), were passed to deal specifically with all aspects of forest administration. It was under Federal control that the first silviculture and fire protection programs were initiated. By 1921 aircraft were used in aerial detection. In 1930, the Forestry Branch of the Provincial Department of Natural Resources was formed and took over control of forestry administration. The Zones only forest reserve was established in 1947 (Cormorant Provincial Forest).

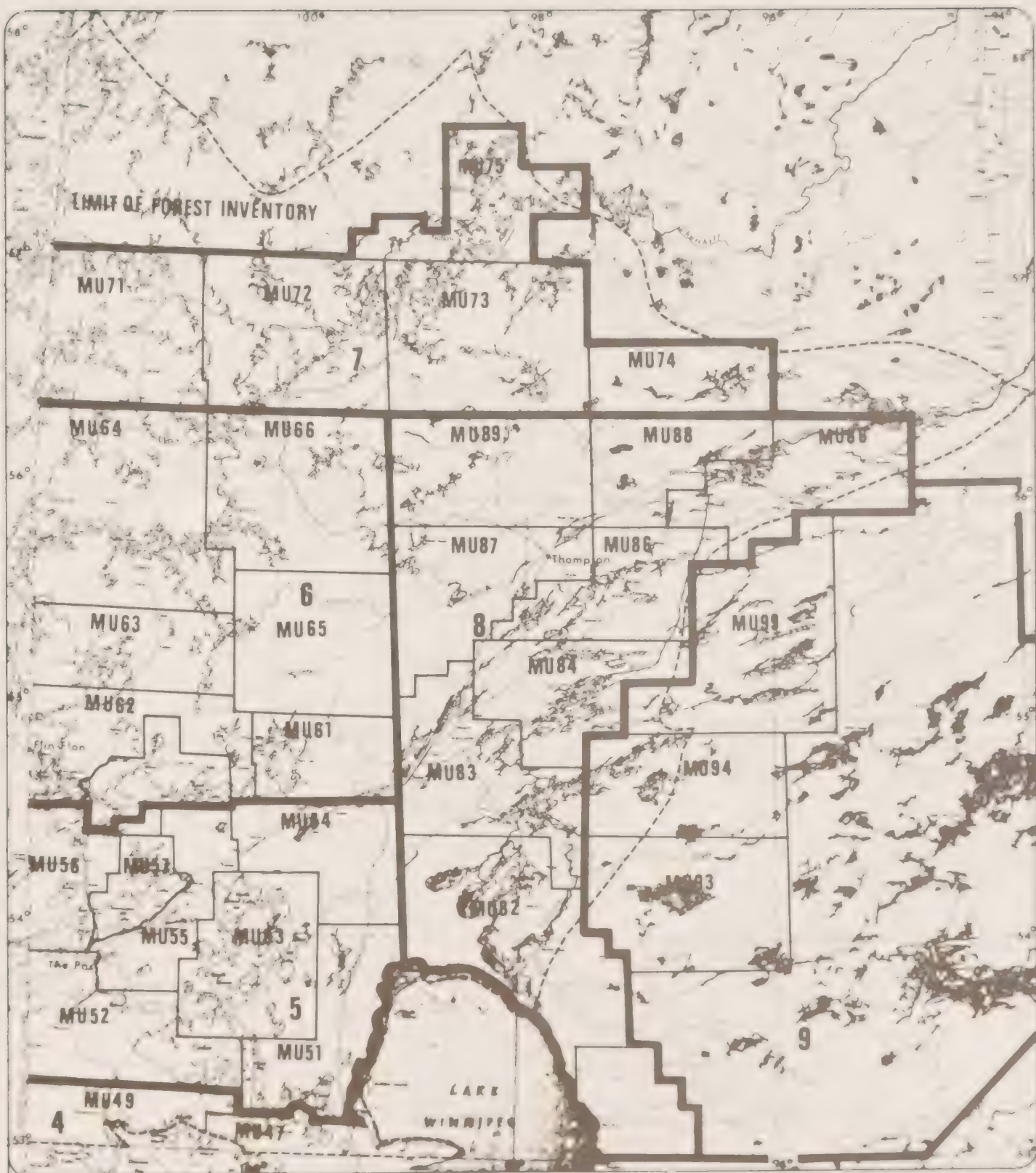
In 1908 the first fire rangers saw action in The Pas area. In the 1920's aircraft bases were established at Norway House and Cormorant Lake and in 1932 the newly organized government air service established a base at Grace Lake.

Status

For the purpose of inventory and records, the commercial forest zone has been divided into forestry management units (MU). The Mid North Planning Zone contains all or part of 31 units (Map 1). Documentation of current forest status is obtained by modifying the inventory data with know changes such as fires and harvesting operations. Map 2 shows the acreage (by township) of intermediate stands of timber. The Sherridon-Snow Lake-Flin Flon and Partridge Crop Lake areas contain the largest acreages of intermediate timber. Map 3 shows the acreage (by township) of mature stands. The highest number of mature acres per township occur in the Goose Lake area. The number of acres of merchantable¹ forest in the Planning Zone are shown on Map 4. The east-central portions of the zone have the highest acreages of merchantable timber. Note that there are only 15 townships in the zone with more than 15,000 acres of merchantable timber.²

¹The terms intermediate, mature and merchantable are used as in Forests of Manitoba (1974).

²The theoretical township is 23,040 acres.



FOREST INVENTORY REGIONS & MANAGEMENT UNITS (MU)

MAP 1. FORESTRY

MID NORTH
PLANNING ZONE



AREA OF INTERMEDIATE STANDS (BY TOWNSHIP IN ACRES)



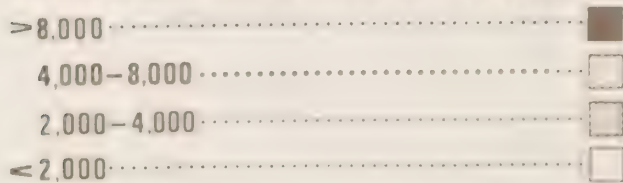
**MAP 2.
FORESTRY**

**MID NORTH
PLANNING ZONE**

1 inch: 40 miles



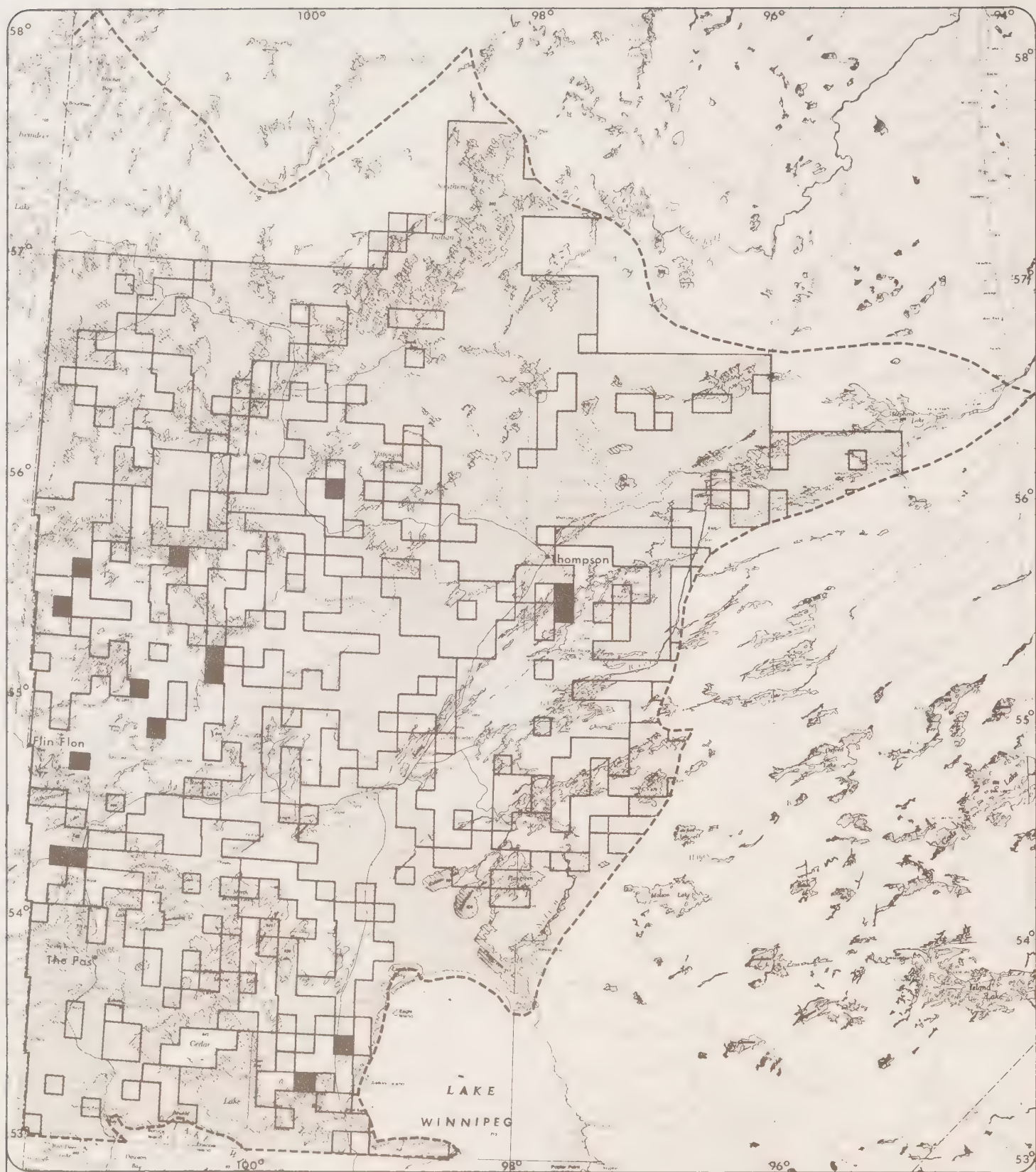
AREAS OF MATURE STANDS (BY TOWNSHIP IN ACRES)



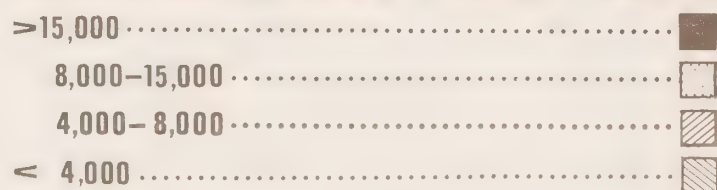
MAP 3. FORESTRY

MID NORTH
PLANNING ZONE

1 inch = 40 miles



MERCHANTABLE STANDS BY TOWNSHIP IN ACRES



Source: Manitoba, Dept. M.R.E.M., 1975.

MAP 4. FORESTRY

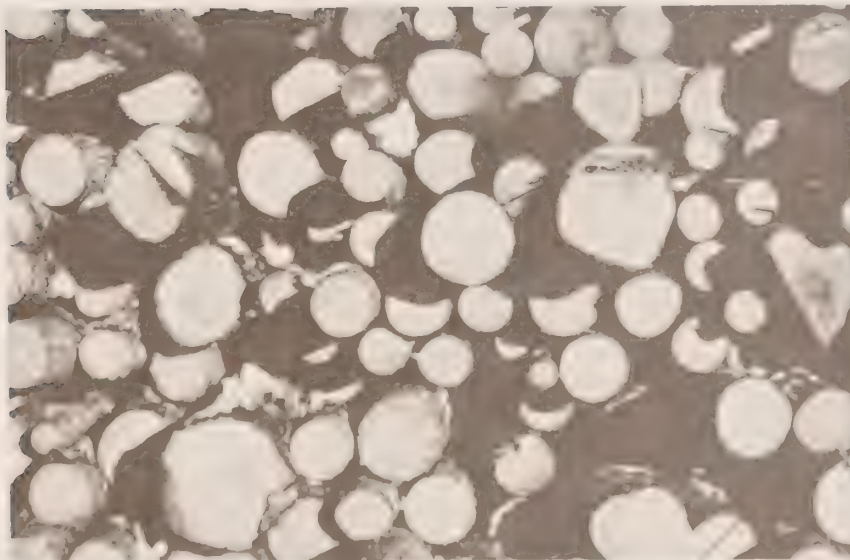
MID NORTH
PLANNING ZONE

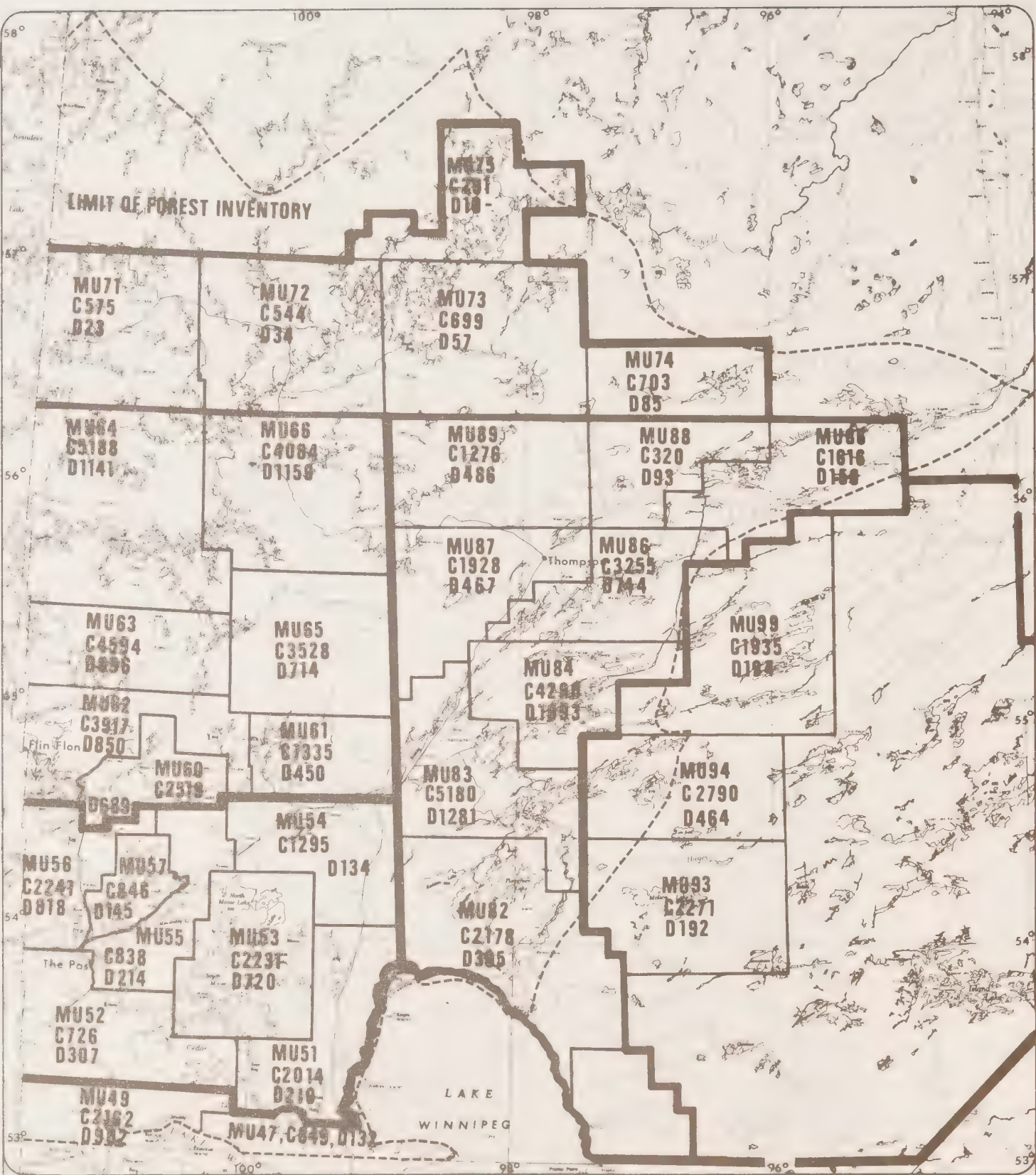
1 inch:40 miles

The net³ merchantable volume by management unit is shown on Map 5 and is broken down by specie (per management unit) in Table 1. Table 2 is a short summary of volume by specie.

Major fires, of course can abruptly change the forest status at any time and any calculations involving acreages or volumes should include a consideration of any fires since the last inventory. Map 6 shows the approximate locations of the more major fires occurring since 1961. Although the number of fires varies widely from year to year, the acreage burned and the extent of individual fires has been reduced in recent years. This is undoubtedly due to improved detection and fire fighting capability.

³After cull factor has been applied





NET MERCHANTABLE VOLUME BY FOREST
MANAGEMENT UNITS (MU) (100,000 CU. FT.)

FOREST INVENTORY REGIONS

CONIFEROUS C
DECIDUOUS D

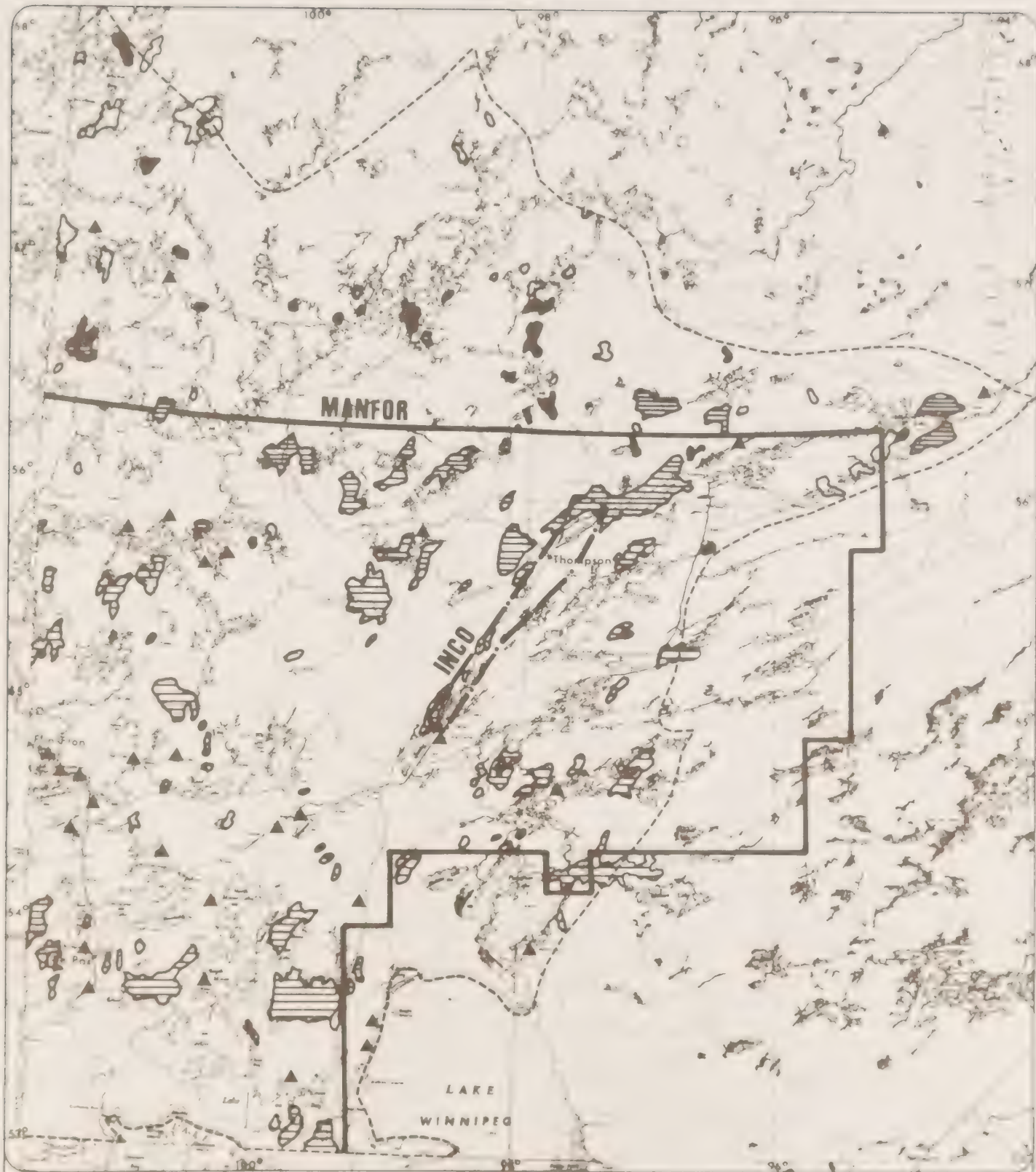
SOURCE: FORESTS OF MANITOBA (1974)

MAP 5.


FORESTRY


MID NORTH
PLANNING ZONE


1 inch = 40 miles



MAJOR FOREST FIRES

1961-1965 

1966-1970 

1971-1975 

1976-1978 

MAP 6. FORESTRY

MID NORTH
PLANNING ZONE

1 inch = 40 miles

Table 1
Net Merchantable Volume by Species & Management Units Provincial Crown Land (100's Cubic Feet)

Forest Management Unit	Cutting Class	Jack Pine	Black Spruce	White Spruce	Balsam Fir	Tamarack Larch	Eastern Cedar	Subtotal Softwood	Trembling Aspen	Balsam Poplar	White Birch	Other Hardwood	Subtotal Hardwood	Total
51	3	794,460	370,230	75,300	2,820	15,890	---	1,258,700	76,810	13,560	13,130	1,190	104,690	1,363,390
	4 & 5	490,990	190,610	67,540	2,630	3,360	---	755,130	74,590	16,180	13,290	940	105,000	860,130
	Total	1,285,450	560,840	142,840	5,450	19,250	---	2,013,830	151,400	29,740	26,420	2,130	209,690	2,223,520
52	3	136,790	216,940	47,740	2,690	13,470	---	417,630	50,270	28,850	7,110	12,920	99,150	516,780
	4 & 5	119,830	143,180	39,050	2,430	4,030	---	308,520	56,310	101,450	7,780	42,450	207,990	516,510
	Total	256,620	360,120	86,790	5,120	17,500	---	726,150	106,580	130,300	14,890	55,370	307,140	1,033,290
53	3	577,460	321,270	136,680	8,360	14,040	---	1,057,810	299,480	39,070	32,870	2,160	373,580	1,431,390
	4 & 5	589,790	316,070	143,840	16,980	2,230	---	1,173,540	219,280	67,930	43,570	15,720	346,500	1,520,040
	Total	1,167,250	637,340	280,520	25,340	16,270	---	2,231,350	518,760	107,000	76,440	17,880	720,080	2,951,430
54	3	299,830	400,560	54,150	2,520	13,100	---	770,160	57,420	8,940	11,380	650	78,390	848,550
	4 & 5	159,060	287,300	68,630	3,530	5,960	---	524,480	38,160	9,110	8,000	40	55,310	579,790
	Total	458,890	687,860	122,780	6,050	19,060	---	1,294,640	95,580	18,050	19,380	690	133,700	1,428,340
55	3	203,160	254,310	54,220	3,080	7,880	---	522,650	72,380	17,560	11,470	2,170	103,580	626,230
	4 & 5	112,500	147,410	51,390	1,950	2,080	---	315,330	56,800	35,270	9,400	9,390	110,860	426,190
	Total	315,660	401,720	105,610	5,030	9,960	---	837,980	129,180	52,830	20,870	11,560	214,440	1,052,420
56	3	183,830	363,220	168,010	10,530	13,050	---	738,640	116,200	30,740	23,220	3,090	173,250	911,890
	4 & 5	432,940	580,910	459,550	22,840	6,020	---	1,502,260	461,090	104,540	67,230	11,900	644,760	2,147,020
	Total	616,770	944,130	627,560	33,370	19,070	---	2,240,900	577,290	135,280	90,450	14,990	818,010	3,058,910
57	3	122,530	181,750	75,570	4,310	4,430	---	388,590	43,800	7,120	10,600	470	61,990	450,580
	4 & 5	120,500	221,360	106,650	7,290	2,100	---	457,900	53,660	11,590	17,280	330	82,860	540,760
	Total	243,030	403,110	182,220	11,600	6,530	---	846,490	97,460	18,710	27,880	800	144,850	991,340
60	3	272,880	867,340	280,400	15,580	4,720	---	1,440,920	281,460	27,560	50,150	---	359,170	1,800,090
	4 & 5	369,990	482,620	209,680	15,280	950	---	1,078,520	272,130	18,440	39,130	---	329,700	1,408,220
	Total	642,870	1,349,960	490,080	30,860	5,670	---	2,519,440	553,590	46,000	89,280	---	688,870	3,208,310
61	3	160,630	621,450	106,480	4,850	4,570	---	897,980	251,580	22,340	36,570	---	310,490	1,208,470
	4 & 5	46,260	318,800	66,980	3,990	1,210	---	437,240	117,240	10,430	11,460	---	139,130	576,370
	Total	206,890	940,250	173,460	8,840	5,780	---	1,335,220	368,820	32,770	48,030	---	449,620	1,784,840
62	3	643,180	1,411,390	356,730	20,280	6,360	---	2,437,940	402,030	35,610	81,300	---	518,940	2,956,880
	4 & 5	536,130	748,560	183,730	9,790	1,290	---	1,479,500	265,460	18,910	46,700	---	331,070	1,810,570
	Total	1,179,310	2,159,950	540,460	30,070	7,650	---	3,917,440	667,490	54,520	128,000	---	850,010	4,767,450
63	3	726,080	2,010,010	269,110	11,670	7,490	---	3,024,360	482,970	41,010	81,720	---	605,700	3,630,060
	4 & 5	604,150	859,710	99,930	5,090	1,080	---	1,569,960	236,140	16,600	37,780	---	290,520	1,860,480
	Total	1,330,230	2,869,720	369,040	16,760	8,570	---	4,594,320	719,110	57,610	119,500	---	896,220	5,490,540
64	3	891,310	2,078,760	203,100	8,800	7,070	---	3,189,040	656,520	58,320	96,620	---	811,460	4,000,500
	4 & 5	521,400	1,332,230	135,900	7,670	1,500	---	1,998,700	264,730	21,180	43,300	---	329,210	2,327,910
	Total	1,412,710	3,410,990	339,000	16,470	8,570	---	5,187,740	921,250	79,500	139,920	---	1,140,670	6,328,410
65	3	905,330	1,803,970	147,400	6,110	11,050	---	2,873,860	442,020	33,520	77,450	---	552,990	3,426,850
	4 & 5	242,420	357,810	50,800	2,980	580	---	654,590	133,210	8,500	19,630	---	161,340	815,930
	Total	1,147,750	2,161,780	198,200	9,090	11,630	---	3,528,450	575,230	42,020	97,080	---	714,330	4,242,780
66	3	870,860	2,368,950	214,110	9,560	10,990	---	3,474,470	807,690	72,900	110,820	---	991,410	4,465,880
	4 & 5	134,720	419,790	51,530	2,640	810	---	609,490	140,720	10,890	16,290	---	167,900	777,390
	Total	1,005,580	2,788,740	265,640	12,200	11,800	---	4,083,960	948,410	83,790	127,110	---	1,159,310	5,243,270
71	3	122,720	302,580	---	5,270	140	---	431,160	12,230	---	4,930	---	17,160	448,320
	4 & 5	40,900	100,860	---	1,900	50	---	143,710	4,080	---	1,640	---	5,720	149,430
	Total	163,620	403,440	---	7,170	190	---	574,870	16,310	---	6,570	---	22,880	597,750
72	3	51,190	342,800	---	13,750	---	---	407,740	15,860	---	9,830	---	25,690	433,430
	4 & 5	17,060	114,260	---	4,580	---	---	135,900	5,290	---	3,280	---	8,570	144,470
	Total	68,250	457,060	---	18,330	---	---	543,640	21,150	---	13,110	---	34,260	577,900
73	3	48,690	455,690	---	19,650	---	---	524,030	28,200	---	14,450	---	42,540	566,680
	4 & 5	16,230	151,900	---	6,550	---	---	174,680	9,400	---	4,810	---	14,210	188,890
	Total	64,920	607,590	---	26,200	---	---	698,710	37,600	---	19,260	---	56,860	755,570
74	3	84,490	423,620	---	19,360	---	---	527,470	45,080	---	18,740	---	67,820	591,290
	4 & 5	28,160	141,200	---	6,450	---	---	175,810	15,030	---	6,250	---	21,280	197,090
	Total	112,650	564,820	---	25,810	---	---	703,280	60,110	---	24,990	---	89,100	788,380
75	3	2,010	171,170	130	---	140	---	173,450	4,020	570	5,270	---	9,860	183,310
	4 & 5	---	117,450	---	---	80	---	117,530	---	---	590	---	590	118,120
	Total	2,010	288,620	130	---	220	---	290,980	4,020	570	5,860	---	10,450	301,430
81	3	143,750	355,090	39,590	6,760	7,340	---	552,530	92,160	11,810	12,160	---	116,130	668,660
	4 & 5	113,900	182,810	42,920	8,030	370	---	348,030	70,940	10,440	13,120	---	94,500	442,530
	Total	257,650	537,900	82,510	14,790	7,710	---	900,560	163,100	22,250	25,280	---	210,630	1,111,190
82	3	160,780	864,750	87,330	20,070	11,940	---	1,144,870	129,820	21,090	26,320	---	177,230	1,322,100
	4 & 5	147,330	685,790	171,770	26,980	1,460	---	1,033,330	161,280	26,770	29,950	---	218,000	1,251,330
	Total	308,110	1,550,540	259,100	47,050	13,400	---	2,178,200	291,100	47,860	56,270	---	395,230	2,573,430
83	3	603,860	1,921,940	145,720	14,340	8,400	---	2,694,260	493,620	49,990	67,260	---	610,870	3,305,130
	4 & 5	568,250	1,515,140	360,490	39,960	1,980	---	2,485,820	548,070	61,160	61,140	---	670,370	3,156,190
	Total	1,172,110	3,437,080	506,210	54,300	10,380	---	5,180,080	1,041,690	111,150	128,400	---	1,281,240	6,461,320
84	3	657,450	1,522,270	125,420	11,870	5,810	---	2,322,820	462,210	47,710	60,180	---	570,100	2,892,920
	4 & 5	454,880	1,131,070	336,530	44,170	1,350	---	1,968,000	422,220	46,190	54,550	---	522,960	2,490,960
	Total	1,112,330	2,653,340	461,950	56,040	7,160	---	4,290,820	884,430	93,900	114,730	---	1,093,060	5,383,880
85	3	481,050	1,403,350	97,840	9,000									

Table 2

Net Merchantable Volume^a Mid North Zone
(by Species in 100's Cubic Feet)

Jack Pine	16,904,560	Trembling Aspen	10,859,510
Black Spruce	36,927,330	Balsam Poplar	1,613,340
White Spruce	6,324,420	White Birch	1,780,160
Balsam Fir	635,270	Others	154,390
Tamarack	434,410		
Subtotal (Softwood)	61,225,990	Subtotal (Hardwood)	14,407,400
Total Volume	75,633,390		

^aCutting classes 3, 4 and 5

Production

Large scale lumber production began in the north in 1910 with the establishment of a mill near The Pas. There are currently a number of sawmills (both portable and stationary) located in the Mid North and one pulp mill.

Maximum potential pulp production per day from the Manitoba Forestry Resources Ltd. (ManFor) plant is 530 tons per day of unbleached kraft pulp or unbleached kraft paper.

Production from the various sawmills in the zone goes to such things as stud lumber, mining and railroad ties and hydro poles. Lumber production of four of the zones major sawmills is in excess of 63 million board feet (Table 3). A more detailed breakdown of production of the ManFor operations is given in Table 4.

The two major cutting areas in the zone are the areas between Kississing and The Pas (Map 7) and the area south of Wabowden (Map 8).

Table 3

Lumber Production
(Millions of Board Feet)

	1977	1976	1975	1974	1973
Manfor ^a	53.0	45.9	40.6	74.9	59.7
Spruce Products ^b	4.2	4.2	1.2	1.0	n.a
Prendiville ^c	1.2	2.5	2.5	2.5	2.5
Prendiville ^d	5.0	3.1	3.1	3.0	3.0

Source: Forest Industries: Vol. 105 No. 6
 Vol. 104 No. 6
 Vol. 103 No. 7
 Vol. 102 No. 6

^aManitoba Forest Resources Ltd. The Pas

^bMill in The Pas

^cMill in Arnot

^dMill in Atik

Table 4

Manitoba Forest Resources 1977-78 Production

	Cut (Cords)	Hauled	Sawn (FBM)
January 1978	16,832.79	26,272.68	3,555,526.00
February 1978	29,924.76	53,565.45	4,962,090.00
March 1978	32,248.78	53,395.68	5,281,397.00
April 1978	26,660.41	36,817.43	5,025,977.00
May 1978	22,340.37	4,203.76	5,157,027.00
June 1978	38,355.21	25,327.33	5,526,213.00
July 1978			
August 1978	5,739.74	23,088.22	4,853,850.00
September 1977	30,286.70	19,414.58	3,944,703.00
October 1977	33,906.93	29,371.77	4,268,588.00
November 1977	28,996.96	11,695.99	4,010,723.00
December 1977	30,830.24	29,787.62	4,319,254.00
TOTAL	296,122.89	312,940.51	50,905,348.00
TOTAL 1977*	291,037.21	241,347.48	48,373,666.00
TOTAL 1976*	255,067.45	318,900.17	48,497,714.00

*Calendar year

Source: Monthly progress reports, Northern Region, Forestry Section. Dept. of Mines, Natural Resources and Environment.

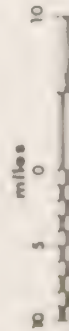
MAP 7. FORESTRY

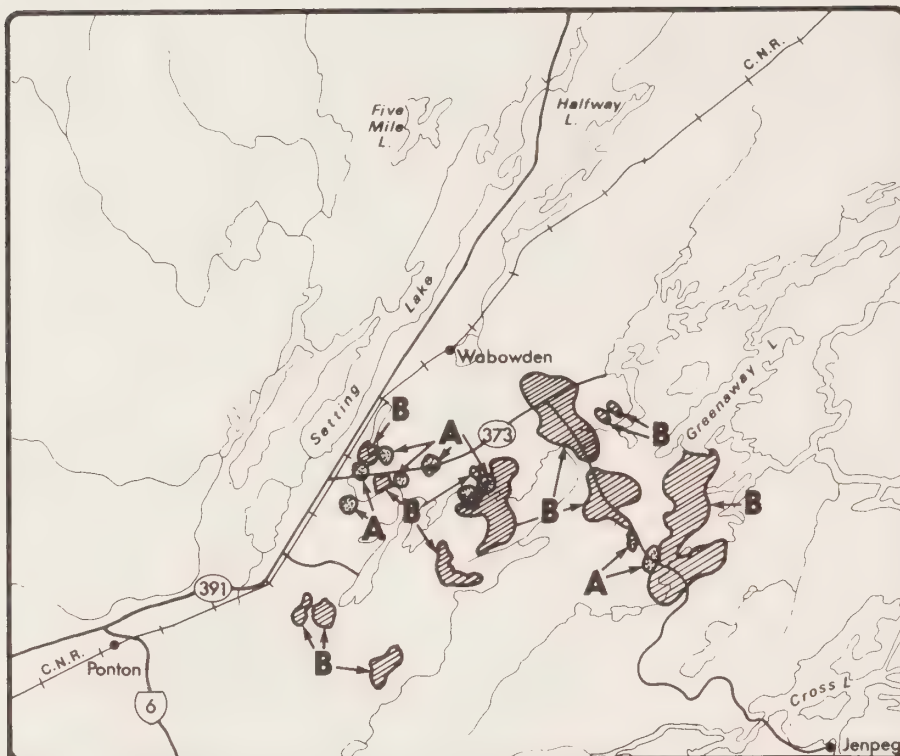
CUT OVERS KISSISSING-THE PAS AREA

- A 1968 73
- B 1973 78

Areas may not be to scale

Mid North Planning Zone





CUT OVERS WABOWDEN AREA

MAP 8. FORESTRY

A 1971 - 73



B 1973 - 78



Areas may not be to scale

Mid North Planning Zone



Capability

The Canada Land Inventory (C.L.I.) has completed the forest capability evaluation for that area south of the 55th parallel and west of the Prime Meridian. The best ratings (class 3 and 4)⁴ are shown on Map 9. The primary limitations to commercial forestry noted by C.L.I. is excess soil moisture. Class 3 (C.L.I.) ratings usually have a productivity of 71-90 cubic feet per acre per year. Class 4 (C.L.I.) rating usually has a productivity range of 51 to 70 cubic feet per acre per year.

Capability is usually expressed in terms of productivity. The productivity of the zone as determined by Forestry planners is shown on Map 10 in cubic feet per acre and on Map 11 in cubic feet per township. The first gives an idea of the individual growth rate, the latter expresses the extent of that rate. When the two maps are combined, a second type of capability rating may be developed (as opposed to C.L.I.). This method incorporates individual acreage productivity with the number of highly productive acres in each township (See Appendix H for details). This generalized capability is expressed on Map 12.

Based on such information as the forest inventory, forest capability and fires, a proposed annual allowable cut has been determined for each management unit. The proposed annual allowable cut (Table 5) was established in order to ensure a continuous supply of timber on a sustained yield basis.

⁴ Ratings are not pure stands, areas shown on Map 9 are those where 50 percent or more of the stand is the rating indicated



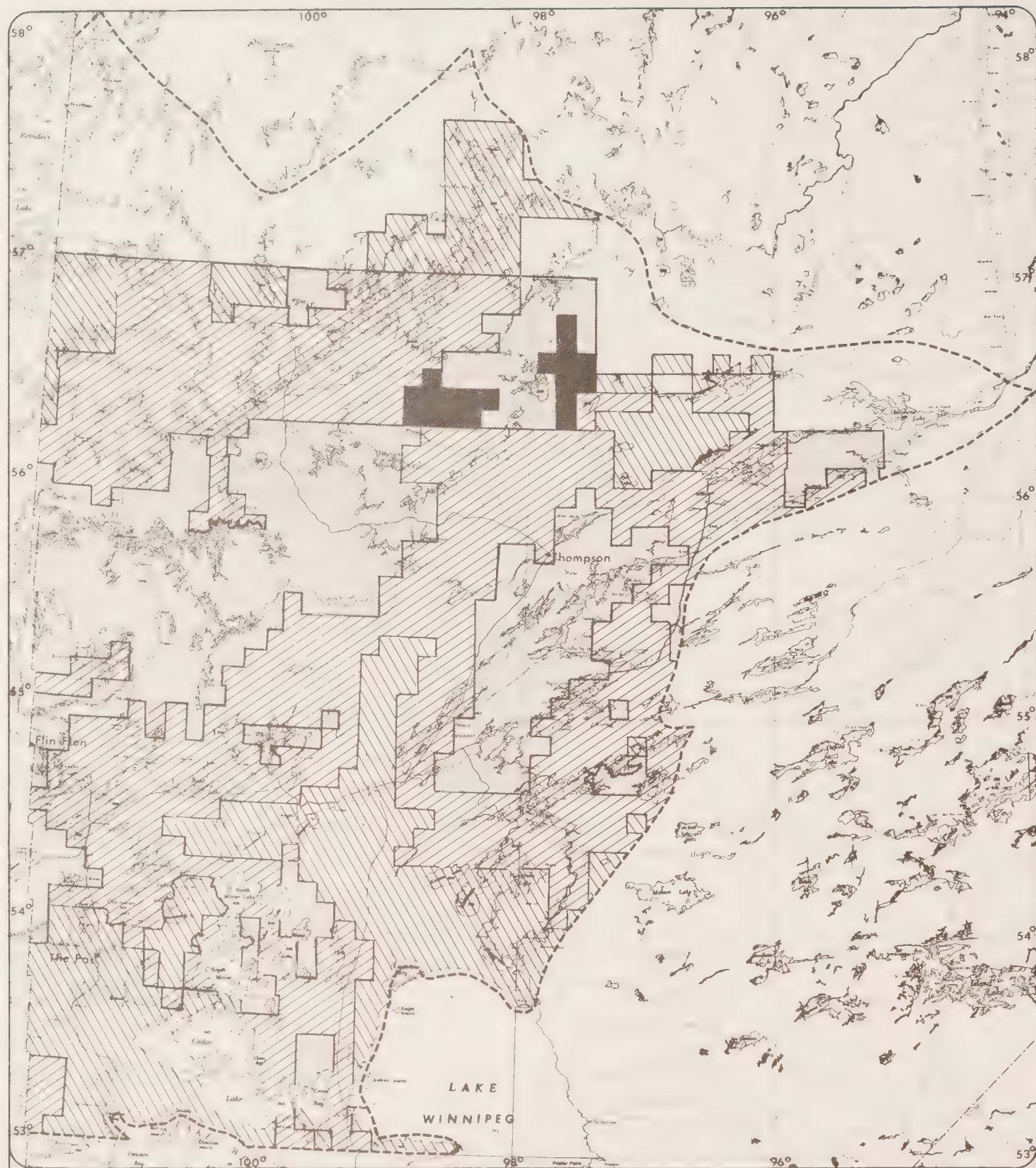
MEAN ANNUAL INCREMENT (cu. ft./acre)

31+		11-15	
21-30		< 10	
16-20			

MAP 10 FORESTRY

MID NORTH
PLANNING ZONE

1 inch = 40 miles



AVERAGE ANNUAL INCREMENT (IN CU.FT.)/TOWNSHIP

> 400,000

250,000 - 400,000

100,000 - 250,000

< 100,000

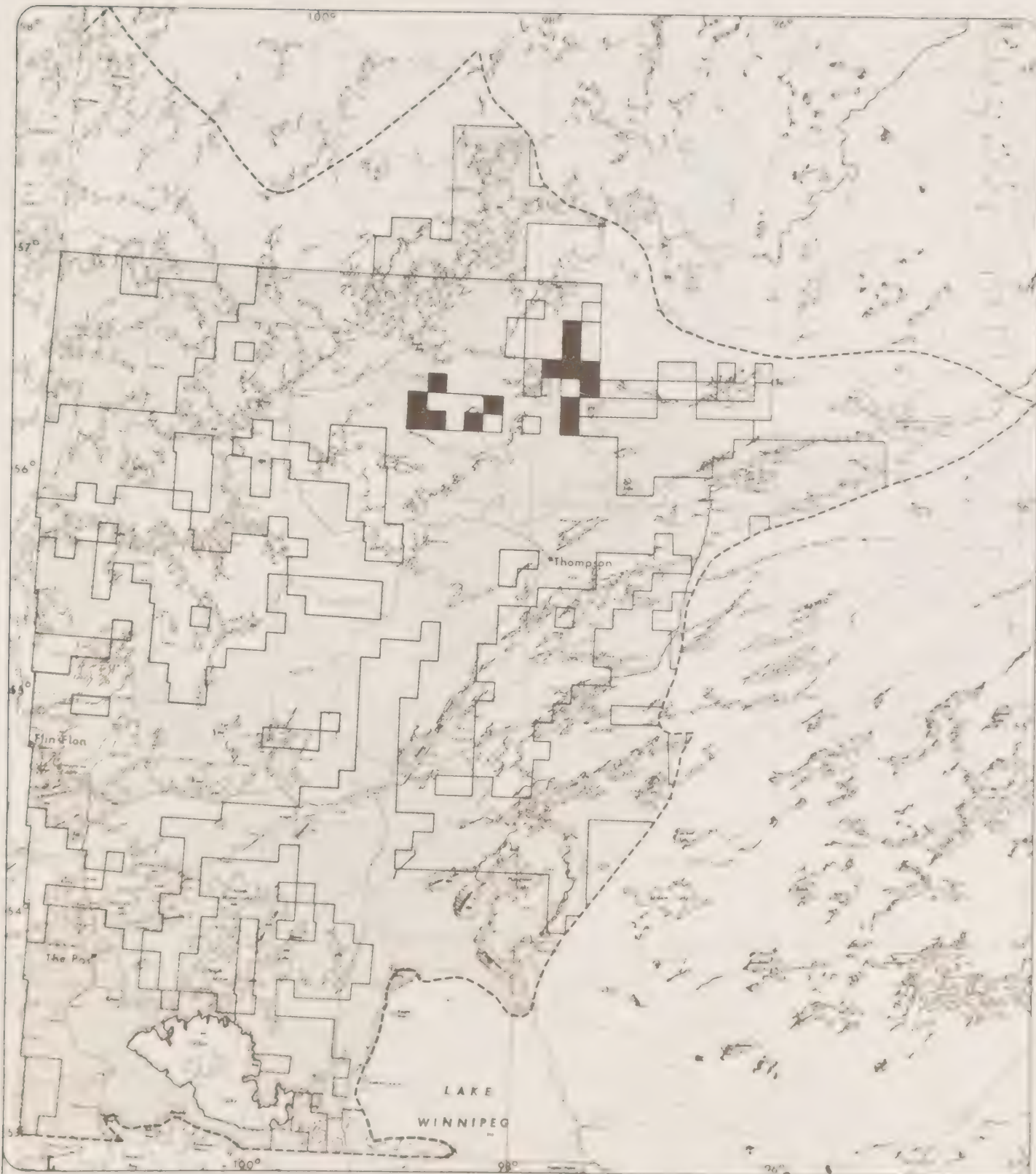


MAP 11.

FORESTRY

**MID NORTH
PLANNING ZONE**

1 inch:40 miles



FOREST CAPABILITY

CAPABILITY *

VERY HIGH

HIGH

MEDIUM

LOW

*FOR CALCULATION OF CAPABILITY SEE APPENDIX H

MAP 12. FORESTRY

MID NORTH
PLANNING ZONE

1 inch = 40 miles

Table 5

Proposed Annual Allowable Cut By Forest Management Units Provincial Crown Land (In 100 Cubic Feet)

Forest Region	Forest Management Unit	Jack Pine	Black Spruce	White Spruce	Balsam Fir	Tamarack Larch	Eastern Cedar	Subtotal Coniferous	Trembling Aspen	Balsam Poplar	White Birch	Other Deciduous	Subtotal Deciduous	Total
5	1	17,630	6,940	2,410	40	-	-	27,020	-	-	-	-	-	27,020
	2	1,430	2,290	820	40	-	-	4,780	-	-	-	-	-	4,780
	3	20,750	9,860	5,200	250	-	-	36,040	-	-	-	-	-	36,040
	4	6,870	5,780	1,770	60	-	-	14,440	-	-	-	-	-	14,440
	5	5,210	4,680	1,520	30	-	-	11,440	-	-	-	-	-	11,440
	6	12,440	12,360	8,930	370	-	-	34,100	-	-	-	-	-	34,100
	7	3,430	4,250	3,250	130	-	-	11,050	-	-	-	-	-	11,050
	Total	77,710	46,450	23,860	920	-	-	138,870	-	-	-	-	-	138,870
6	1	8,220	9,870	3,770	280	-	-	22,140	-	-	-	-	-	22,140
	2	3,380	11,000	2,260	120	-	-	16,760	-	-	-	-	-	16,760
	3	18,860	25,000	5,800	360	-	-	50,020	-	-	-	-	-	50,020
	4	22,000	29,780	3,300	190	-	-	55,270	-	-	-	-	-	55,270
	5	24,490	48,200	4,480	270	-	-	77,440	-	-	-	-	-	77,440
	6	17,890	23,530	2,430	100	-	-	43,750	-	-	-	-	-	43,750
	7	9,770	27,190	2,410	140	-	-	39,510	-	-	-	-	-	39,510
	Total	107,610	174,370	24,450	1,460	-	-	304,890	-	-	-	-	-	304,890
7	1	2,070	3,880	-	110	-	-	6,080	-	-	-	-	-	6,080
	2	880	4,390	-	250	-	-	5,520	-	-	-	-	-	5,520
	3	820	5,830	-	360	-	-	7,010	-	-	-	-	-	7,010
	4	1,440	5,420	-	350	-	-	7,210	-	-	-	-	-	7,210
	5	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	5,230	19,520	-	1,070	-	-	25,820	-	-	-	-	-	25,820
8	1	4,370	5,340	1,240	240	-	-	11,190	-	-	-	-	-	11,190
	2	5,390	15,470	5,590	750	-	-	27,200	-	-	-	-	-	27,200
	3	22,820	48,360	8,690	950	-	-	80,820	-	-	-	-	-	80,820
	4	18,190	41,950	9,390	1,280	-	-	70,810	-	-	-	-	-	70,810
	5	14,410	33,510	5,160	610	-	-	53,690	-	-	-	-	-	53,690
	6	4,830	13,680	1,350	120	-	-	19,980	-	-	-	-	-	19,980
	7	9,040	14,130	1,260	60	-	-	24,490	-	-	-	-	-	24,490
	8	790	690	70	-	-	-	1,550	-	-	-	-	-	1,550
	9	2,720	5,250	90	-	-	-	8,060	-	-	-	-	-	8,060
	Total	82,560	178,380	32,840	4,010	-	-	297,790	-	-	-	-	-	297,790

Source: Forests of Manitoba 1974



Mineral Resources

The mineral industry is a major component of Canada's economic base. In 1975, the industry's mineral production was valued at \$13,403 million - 8.3% of gross national product.¹ Direct employment estimates for the mining industry in Canada amounted to 53,000.² The strength of Canada's mineral industry is based on export sales. Approximately 82.0% of total mineral production in 1975 was exported with crude minerals (i.e. not including oil and natural gas) comprising 67.2%. In 1975 the exported minerals were valued at \$10,987 million or 34.2% of the \$32,096 million total of merchandise exports. In Manitoba, mineral production in 1975 was valued at \$533.2 million. Manitoba produced 26.4% of Canada's nickel, employing approximately 6000 people in 1977 with an average weekly wage of \$308.00.

Prospecting in Manitoba began prior to World War I with first production coming from the Mandy Mine (Flin Flon) in 1917. Metallic mineral production has largely been centered in the Mid North Planning Zone whereas industrial minerals are predominantly obtained from Southern Manitoba.

Gold deposits were discovered at Herb Lake in 1914 and intermittently between 1917 and 1939 a number of mines in the area were developed producing gold, and to a lesser degree silver. The Gurney Mine near Flin Flon, also a gold producer, was active between 1937 and 1939. The Nor-Acme mine on Snow Lake produced between 1949 and 1958.

Base metal mining has far outshadowed gold production in the Zone. The first copper-zinc deposit to be brought into production was the Mandy Mine which operated from 1917 to 1920 and again in 1943 and 1944. By 1928 a rail line from The Pas had reached the site and by 1930 production had commenced in the Flin Flon Mine.

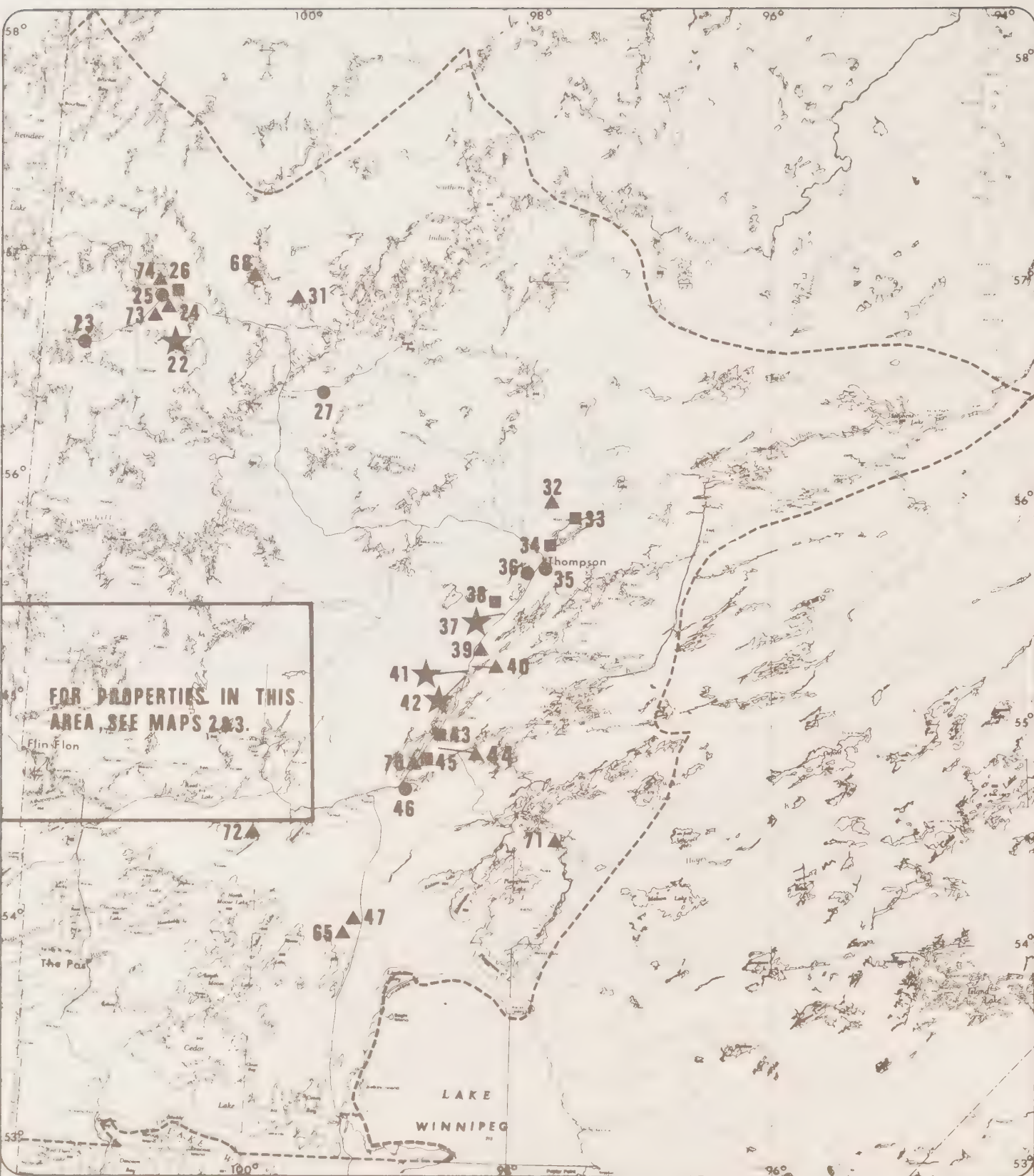
These early discoveries prompted prospecting in the Kississing Lake area, resulting in the development of a mine at Sherridon. This Sherritt Gordon mine produced copper-zinc from 1931-32 and again between 1937 and 1951. The "A" mine and the "EL" mine (nickel-copper) at Lynn Lake were brought into production in 1953, with the concentrator and mining plant being moved from Sherridon by winter tractor train.

¹total G.N.P. for 1975 was \$161,132 million

²Canada Year Book 1976-77 Special Edition p. 393

Within the Planning Zone there are 74 mine properties which have known mineral reserves. The dispositions and locations of these holdings are shown on Map 1. Property owners and major production commodities are listed in Table 1.





MINERAL PROPERTY DISPOSITIONS

- PAST PRODUCER
- DEVELOPED PROSPECT
- PRESENT PRODUCER (FOR NUMBERS SEE TABLE 1a)
- EXHAUSTED
- DORMANT
- UNDERGROUND
- SURFACE or DIAMOND DRILLING



MAP 1.

MINERAL RESOURCES

MID NORTH
PLANNING ZONE

1 inch:40 miles



FLIN FLON DISTRICT MINING PROPERTIES

PAST PRODUCER

EXHAUSTED
DORMANT

DEVELOPED PROSPECT

UNDERGROUND
SURFACE or D. DRILLING

PRESENT PRODUCER

(FOR NUMBERS SEE TABLE 1a)

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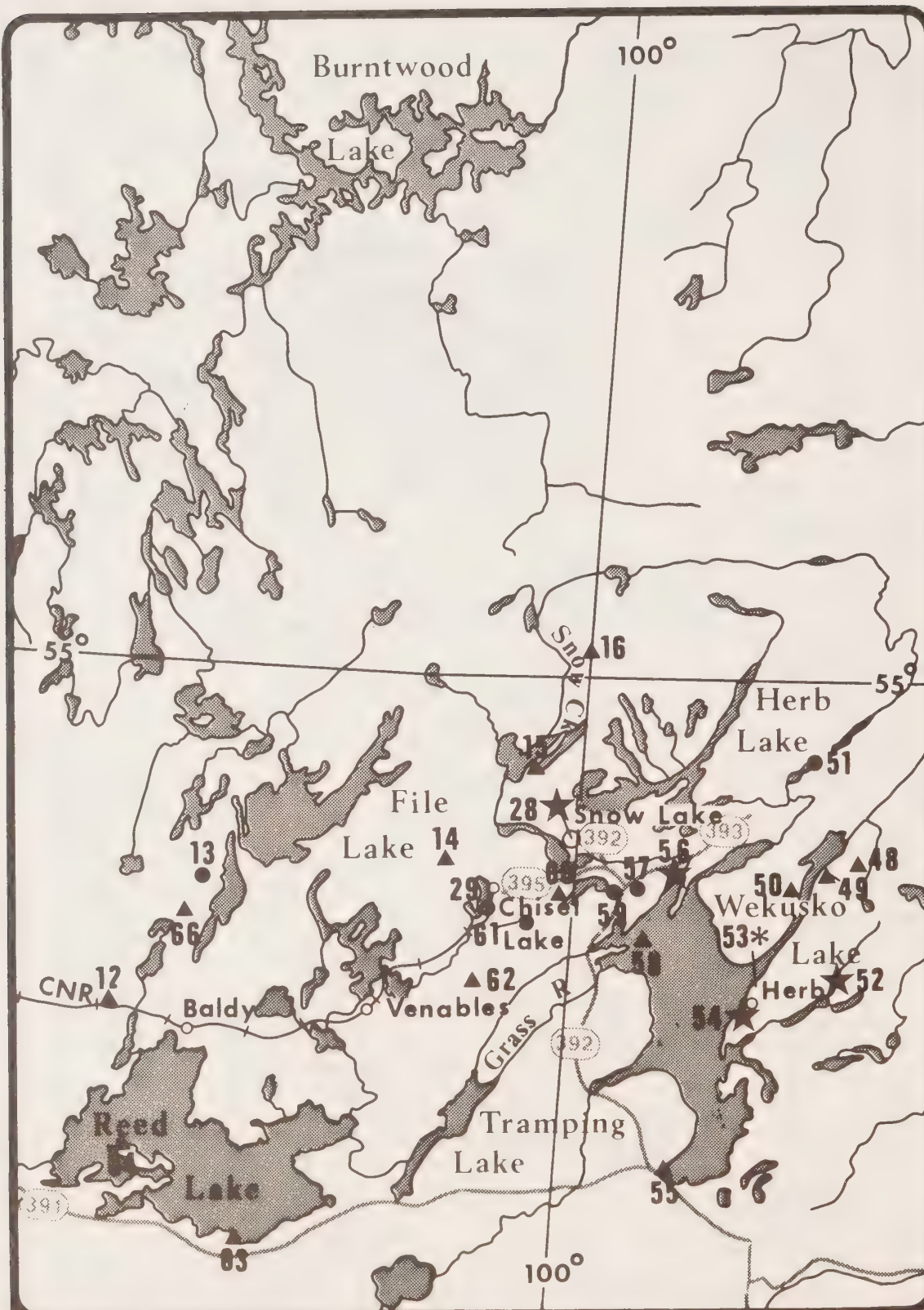
MAP 2.

MINERAL RESOURCES

MID NORTH

PLANNING ZONE





SNOW LAKE DISTRICT MINING PROPERTIES MAP 3.

PAST PRODUCER

EXHAUSTED
DORMANT



MINERAL RESOURCES

DEVELOPED PROSPECT

SURFACE or
DIAMOND DRILLING



MID NORTH
PLANNING ZONE

PRESENT PRODUCER



(FOR NUMBERS SEE TABLE 1a)



Table 1a

Mining Properties in the Mid North

Map Locality No.	Property Name	Status Table	Property Holder	Location		Major Commodities and/or Reserves
				Lat.	Long.	
1	Flin Flon	C5	Hudson Bay Mining and Smelting Co., Limited	54° 46'	101° 53'	3,847,000 Tons; 2.0% Cu; 2.3% Zn; 56 oz/ton Ag; .05 oz/ton Au
2	Mandy	A5	Hudson Bay Mining and Smelting Co. Limited	54° 42'	101° 51'	Produced 25,000 Tons Cu ore av. 20% Cu between 1917 and 1920. Produced 125,021 Tons av. 5.47% Cu, 16.5% Zn; 0.095 oz/ton Au; 1.9 oz/ton Ag between 1943 and 1944-Geology & Mineral Resources of Manitoba, p. 72
3	Schist Lake	A5	Hudson Bay Mining and Smelting Co. Limited	54° 43'	101° 49'	145,800; 4.71% Cu; 5.3% Zn; .72 oz/ton Ag, .026 oz/ton Au
4	Cuprus	A?	Hudson Bay Mining and Smelting Co., Limited	54° 42'	101° 42'	Produced 509,374 Tons av. 3.25% Cu; 6.4% Zn; 0.038 oz/ton Au; 0.84 oz/ton Ag between 1948 and 1952-G.S.C. Paper 71-27, p. 43
5	White Lake	C4	Hudson Bay Mining and Smelting Co., Limited	54° 42'	101° 42'	Cu; Zn; Ag; Au (See: Can. Mines Handbook 75/76 for production).
6	Pine Bay	D3	Pine Bay Mines Ltd.	54° 46'	101° 37'	1,500,000 Tons; 1.3% Cu-Can. Mines Handbook 75/76
7	Baker-Patton	D5	Cerro Mining Company of Canada Limited	54° 46'	101° 34'	Narrow bodies of 3% Cu and larger bodies of low-grade copper and gold
8	North Star-Don Jon	A5-A2	Hudson Bay Mining and Smelting Co., Limited	54° 46'	101° 34'	North Star-produced 218,847 Tons of Cu ore between 1955 and 1958. Don Jon-produced 69,811 Tons of Cu ore between 1955 and 1957. - Geology and Mineral Resources of Manitoba, p. 73.
9	Centennial	C4	Hudson Bay Mining and Smelting Co., Limited	54° 42'	101° 40'	1,400,000 Tons; 2.6% Zn; 2.06% Cu; 0.70 oz/ton Ag; 0.04 oz/ton Au to 1200 ft. as of 1970 - Can. Mines Handbook 75/76.
10	Lucille Lake	E2	P. Bachnick & H. Howell	54° 42'	101° 22'	Zone 5-10 ft. wide of 2-3% Cu-Northern Miner 64 11 05
11	Curney	A2	W.B. Dunlop	54° 44'	100° 11'	Produced 25,164 ounces of Au between 1937 and 1939 Geology and Mineral Resources of Manitoba, p. 75.
12	Rail Lake	E3	Hudson Bay Mining and Smelting Co., Limited	54° 45'	100° 35'	325,000 Tons; 3.0% Cu; 0.7% Zn to 1000 ft. - Can. Mines Handbook 75/76
13	Dickstone	B4	Dickstone Copper Mines Limited	54° 51'	100° 29'	473,142 Tons; 2.4% Cu; 3.5% Zn; 0.009 oz/ton Au; 0.29 oz/ton Ag as of 74 12 31 - Can. Mines Handbook 75/76.
14	Bomber	E2	Falconbridge Nickel Mines Limited	54° 52'	100° 11'	750,000 Tons; 0.04% Cu; 1.00% Zn-calculated from M.I. card.
15	Squall Lake	E2	Squall Lake Gold Mines Limited	54° 56'	100° 04'	520,000 Tons; 0.215 oz/ton Au-calculated from M.I. card.
16	Win	E3	Hudson Bay Mining and Smelting Co., Limited	55° 02'	100° 03'	1,090,000 Tons; 2.91% Cu to 2000-ft. level as of 1969 - Can. Mines Handbook 75/76.
17	Century	B3	Hudson Bay Mining and Smelting Co., Limited	54° 52'	100° 52'	Produced 59.6 ounces of Au in 1942 from reserves estimated to be 100,500 Tons av. 0.32 oz/ton Au and 95,000 Tons av. 0.27-0.31 oz/ton Au in 1942 - Northern Miner 41 02 27.
18	Vamp Lake	E3	Hudvam Mines Limited	54° 56'	101° 10'	401,200 Tons; 1.5% Cu; 1.7% Zn; 0.12 oz/ton Au, 0.43 oz/ton Ag - Can. Mines Handbook 75/76
19	Sherridon	A1	Sherritt Gordon Mines Limited	55° 07'	101° 06'	Produced 8,531,352 Tons av. 2.1% Cu; 0.9% Zn, 0.4 oz/ton Ag, 0.01 oz/ton Au between 1931 and 1951 - Geology and Mineral Resources of Manitoba, p. 101. Closed not open to staking 77 12 11
20	But Lake	E4	Sherritt Gordon Mines Limited	55° 09'	101° 00'	1,509,300 Tons; 1.2% Cu; 1.28% Zn Sherritt Gordon 545,000 Tons; 1.36% Cu; 1.33% Zn Annual Report 276,000 Tons; 1.80% Cu; 0.4% Zn for 1944
21	Jungle	E3	Hudson Bay Mining and Smelting Co., Limited	55° 10'	100° 54'	1,700,000 Tons; 1.4% Cu; 1.1% Zn - Geology and Mineral Resources of Manitoba, p. 105
22	Lasthope	B2	Lasthope Lake Gold Mines Limited	56° 41'	100° 50'	140,000 Tons; 0.23 oz/ton Au to 150 ft. as of 1949 - Geology and Mineral Resources of Manitoba, p. 121.
23	Bus Mine	C4	Sherritt Gordon Mines Limited	56° 36'	101° 19'	8,700,000 Tons av. .95% Cu, .1% Zn as of 75 11 11 - Sherritt Gordon Annual Report 1976

Map Locality No.	Property Name	Status Table	Property Holder	Location Lat.	Long.	Major Commodities and/or Reserves
24	D.H. & F. L.	E2	Granges Exploration Aktiebolag	56° 50'	101° 01'	500,000 Tons; 2.2% Zn; 0.9% Cu as of 1952 - Geology and Mineral Resources of Manitoba, p. 122.
25	Lynn Lake	C5	Sherritt Gordon Mines Limited	56° 50'	101° 02'	Produced 352,000 Tons of ore 0.84% Ni; 0.38% Cu in 1975 possibly will become dormant in 1976 - Sherritt Gordon Annual Report for 1975.
26	Royal Agassiz	D3	Royal Agassiz Mines Limited	56° 54'	100° 57'	1,583,000 Tons av. 0.32 oz/ton Au; 1.2 oz/ton Ag - Can. Mines Handbook 75/76.
27	Ruttan	C4	Sherritt Gordon Mines Limited	56° 28'	99° 38'	43,600,000 Tons av. 1.45% Cu; 1.49% Zn as of 75 12 31 - Sherritt Gordon Annual Report for 1975.
28	Nor-Acme	B3	Nor-Acme Gold Mines Limited	54° 53'	100° 01'	469,100 Tons av. 0.16 oz/ton Au plus additional ore in 2 other zones - Can. Mines Handbook 75/76.
29	Chisel	C5	Hudson Bay Mining Smelting Co., Limited	54° 50'	100° 06'	1.22 oz/Ton Ag; .047 oz/Ton Au, 2,474,500 Tons: .40% Cu; 0.8% Pb; 11.5% Zn.
30	Westarm	C4	Hudson Bay Mining Smelting Co., Limited	54° 39'	101° 50'	710,000 Tons av. 4.6% Cu; 0.6% Zn to 1400 feet level - Can. Mines Handbook 75/76.
31	MacBride Lake	E2	Mattagami Lake Mines Limited	56° 54'	99° 54'	534,000 Tons; 8.77% Zn; 0.35% Cu to 1200 feet - Northern Miner 76 03 04
32	Mel Zone	E3	The International Nickel Co., of Canada	55° 58'	99° 46'	Ni-tonnage and grade unknown
33	Moak	D5	The International Nickel Co., of Canada	55° 56'	97° 35'	50,000,000 Tons; 0.7% Ni - Northern Miner 61 08 17 Unknown Cu
34	Mystery Lake (South)	D5	The International Nickel Company of Canada, Limited	55° 50'	97° 46'	50,000,000 Tons; 0.5% Ni - Unknown Cu
35	Thompson	C5	The International Nickel Company of Canada, Limited	55° 43'	97° 51'	Proven reserves 25,000,000 Tons 2.8% Ni; 0.2% Cu. Minor quantities Cobalt, Platinum, Palladium, Gold and Silver
36	Birchtree	C4	The International Nickel Company of Canada, Limited	55° 42'	97° 55'	Proven Reserves of Thompson, Birchtree, Pipe & Soab, 71,550,000 Ton Ni - 1,400,000 Tons, Cu - 100,000 Tons
37	Pipe No. 1	B5	The International Nickel Company of Canada, Limited	55° 30'	98° 09'	Ni; Cu - tonnage and grade of production and reserves unknown.
38	Pipe No. 2 Open Pit	D5- B5	The International Nickel Company of Canada, Limited	55° 30'	98° 09'	Ni; Cu - tonnage and grade of production and reserves unknown.
39	Hambone- Maralgo	E3	The International Nickel Company of Canada, Limited	55° 18'	98° 20'	3,600,000 Tons; 0.81% Ni and 1,200,000 Tons; 1.10% Ni - Northern Miner 58 10 02.
40	Grass River	E5	The International Nickel Company of Canada, Limited	55° 14'	98° 21'	Ni - tonnage and grade unknown
41	Soab North	B5	The International Nickel Company of Canada, Limited	55° 15'	98° 24'	Ni; Cu - tonnage and grade unknown
42	Soab South	B5	The International Nickel Company of Canada, Limited	55° 13'	98° 25'	Ni; Cu - tonnage and grade unknown
43	Bowden Lake	D3	Bowden Lake Nickel Mines Limited	54° 55'	98° 39'	80,000,000 Tons; 0.6% Ni with widths up to 1000 feet - Can. Mines Handbook 75/76.
44	Discovery	E3	Bowden Lake Nickel Mines Limited	54° 54'	98° 37'	Several ore lenses; av. 2000 tons/vert. ft. grading 0.8% Ni; av. 522 tons/vert. ft. grading 1.36% Ni; and av. 508 tons/vert. ft. grading 1.36% Ni-National Malartic Gold Mines Limited prospectus.
45	Bucko Lake	D3	Bowden Lake Nickel Mines Limited	54° 53'	98° 40'	30,000,000 Tons; 0.80% Ni to 2000 ft. - Can. Mines Handbook 75/76. 2,316,500 Tons; 2.38% Ni Cu unknown.
46	Manibridge	C4	Falconbridge Nickel Mines Limited	54° 42'	98° 50'	1,409,100 Tons; 2.55% Ni prior to production in July 1971 - Can. Mines Handbook 75/76. Closed June/77
47	Reservation 34, Area 1	E3	Amax Potash Limited	54° 05'	99° 11'	7,300,000 Tons; 1.33% Ni (1% cutoff) to 1200 feet - CIM Bull, v. 68, no. 761, P. 77 (Roth, 1975).
48	Greenbay	E2	J. A. Syme	54° 52'	99° 39'	2,000,000 Tons; 1.4% Li ₂ O - Manitoba Mines Branch, Geol. Paper 2/73, p. 30 (Bannatyne, 1973).

Locality No.	Locality Name	Table	Holder	Lat.	Long.	and/or Reserves
49	Violet	E2	G. F. Thompson	54° 51'	99° 43'	5,800,000 Tons; 1.22 Li ₂ O - Manitoba Mines Branch, Geol. Paper 2773, p. 30 (Bannatyne, 1973).
50	Gold Reef	E3	Sherritt Gordon Mines Limited	54° 51'	99° 44'	225,000 Tons; 1.22 Li ₂ O - Manitoba Mines Branch, Geol. Paper 2773, p. 30 (Bannatyne, 1973).
51	Gaborne Lake	C5	Hudson Bay Mining and Smelting Co., Limited	54° 57'	99° 43'	1,925,200 Tons; 3.64% Cu; 1.52 Zn Unknown Ag-Au
52	Ferro	B2	Crowduck Bay Mines Limited	54° 48'	99° 42'	60,654 Tons; 0.508 oz/ton Au and 5,000 Tons; 0.35 oz/ton Au in open pit - Can. Mines Handbook 74/75
53	Laguna	A2	W.B. Kobar	54° 47'	99° 46'	Produced 1,377 ounces of Au in 1918; 5,517 ounces of Au during 1924-25; and 52,462 ounces Au and 6,117 ounces Ag during 1936 - 39 - Geology and Mineral Resources of Manitoba, p. 83.
54	Moonehorn - Ballast	B2	A. S. Kish	54° 46'	99° 47'	Produced 108 ounces Au in 1917, 52 ounces Au in 1918, and 3 - ounces Au and 9 ounces Ag in 1931 - Geological Survey of Canada, Mem. 208, p. 31, 32 (Stockwell, 1937).
55	Copper-Man	E3	Hartland Mines Ltd.	54° 39'	99° 53'	170,000 Tons; 4.17% Zn; 3.13% Cu and 74,200 Tons; 3.19% Zn; 1.49% Cu - Can. Mines Handbook 75/76.
56	Little Stall Lake	B3	Stall Lake Mines Limited	54° 54'	99° 53'	672,641 Tons; 5.38% Cu; 2.28% Zn - Can. Mines Handbook 75/76.
57	Stall Lake	C5	Hudson Bay Mining and Smelting Co., Limited	54° 51'	99° 56'	3,401,500 Tons; 4.85% Cu; .62 Zn; .25 oz/ton Ag; .03 oz/ton Au
58	Rice Island	E3	The International Nickel Company of Canada, Limited	54° 48'	99° 55'	Cu; Ni - tonnage and grade unknown
59	Anderson Lake	C5	Hudson Bay Mining and Smelting Co., Limited	54° 51'	99° 59'	2,128,500 Tons; 3.46% Cu; .1% Zn; .18 oz/ton Ag; .012 oz/ton Au
60	Joannie	E2	Hudson Bay Exploration and Development Company Limited	54° 50'	100° 02'	500,000 Tons; 1.28% Cu - calculated from M.I. card. Unknown Zn
61	Ghost-lost Lake	D5	Hudson Bay Mining and Smelting Co., Limited	54° 50'	100° 06'	Ghost-Cu; Zn; Pb; Ag; Au (See: Can. Mines Handbook 75/76 for production). <u>Lost Lake</u> - 247,300 Tons; 1.45% Cu; 4.9% Zn; 1.07% Pb; 2.37 oz/ton Ag; 0.085 oz/ton Au - to be mined and developed from Ghost Lake decline - Can. Mines Handbook 75/76.
62	Pot Lake	E2	Hudson Bay Exploration and Development Company Limited	54° 47'	100° 11'	100,000 Tons; 4.5% Zn; 1.43% Cu; 0.552 oz/ton Ag. 0.11 oz/ton Au - calculated from M.I. card.
63	Spruce Point	E2	Hudson Bay Exploration and Development Co.Ltd.	54° 35'	100° 24'	1,000,000 Tons; 4% Zn; 2% Cu - Northern Miner 73 11 22
64	Reed Lake	E2	Hudson Bay Exploration and Development Company Limited	54° 38'	100° 33'	1,500,000 Tons; 2.09% Cu to 1800 ft. - Can. Mines Handbook 75/76
65	Reservation 34, Area 1	E3	Amax Potash Limited	54° 02'	99° 12'	Ni - tonnage and grade unknown
66	Jack - Daisy The Pan	E3	J. W. Robinson	54° 49'	100° 35'	Nature of mineralization uncertain - Au; Cu reported from immediate vicinity
67	Eppa	E3	Pine Bays Mines Limited	54° 42'	101° 39'	Nature of mineralization uncertain - Cu reported from immediate vicinity
68	Darrington Lake	E2	Hudson Bay Exploration and Development Company Limited	56° 58'	100° 18'	250,000 Tons; 2.5% Cu - N.M.I. Reserves File, Jan. 1975.
69	Mokomie Lake	E2	Dome Exploration (Canada) Limited	55° 05'	100° 52'	100,000 Tons; 0.3 oz/ton Au - N.M.I. Reserves File, Jan. 1975.
70	Deering Lake South	E2	LaRonge Mining Ltd. W.B. Dunlop	54° 49'	98° 46'	100,000,000 Tons; 0.2% - 0.10% Ni to 1000 ft. - LaRonge Mining Limited Prospects 2471
71	Grube Lake	E2	Boranda Exploration Company Limited	54° 31'	97° 44'	1-1 1/2 Mill Tons, possible grading 28.02 Fe, 1-21 Ti
72	Farewell Lake	E2	Manitoba Mineral Resources Ltd.	54° 29'	100° 03'	283,000 Tons; 2.03% Cu
73	21 Impwell	E5	Sherritt Gordon Mines Ltd.	54° 50'	101° 02'	151,000 Tons; 1.13% Cu, .14% Fe, .004% Zn-Au
74	Good Enough	E5	Sherritt Mines Ltd.	56° 54'	101° 05'	182,000 Tons; 2.83% Cu, 1.23% Zn, .08 oz/ton Au

TABLE 1b
EXTENT OF DEVELOPMENT *

EXTENT OF DEVELOPMENT						
DISPOSITION OF PROPERTY	DEVELOPED PROSPECT		PRODUCERS ●	PAST PRODUCER		
	▲ SURFACE & D.D.H.	■ UNDERGROUND DEVELOPMENT		DORMANT ★	EXHAUSTED *	
	OPEN	E1	D1	—	B1	A1
	CLAIM OR C.B.	E2	D2	—	B2	A2
	E.A.L.	E3	D3	—	B3	A3
	P.L.	E4	D4	C4	B4	A4
	O.I.C.L.	E5	D5	C5	B5	A5

*** AS OF JUNE, 1976.**

Hudson Bay Mining and Smelting (HBMS)

The town of Flin Flon is the site of the largest zinc refinery and the third largest copper smelter in Canada. HBMS employed 2363 persons in the Flin Flon-Snow Lake area (Table 2).

Table 2
Employment in the Mid-North Mining Industry

Company		Employment			% Change 1976-77
		1974	1976	1977	
Sherritt Gordon	Ruttan	532	604	642	+6.2
	Lynn Lake	860	198	164	-17.7
	Fox		323	339	+4.2
International Nickel	Thompson		1125	1929	71.4
	Birchtree	3129	475	259	-45.4
	Pipe		145	135	-6.8
	Others		1855	1039	-43.9
Hudson Bay Mining and Smelting	All Mining Properties Including Refinery and Smelter	2550	2404	1566	-34.8
Falconbridge	Manibridge	N/A	120	55 Closed Jun, 1977	

Source: Personal Communication Mr. Glassford, Chief Mining Inspector

The Flin Flon property started production in 1930 and up to December 1976 the concentrator treated 77,732 tons of ore.³ The concentrator capacity of 6700 tons daily was increased by 15 percent in 1973 when rod mills were installed. The 1977 production of metals was 135,363,453 lbs. of refined copper; 151,820,011 lbs. of slab zinc; 219,373 lbs. of cadmium; 135,350 lbs. of selenium; 74,393 oz. of gold; 1,322,039 oz. of silver; and 915,188 lbs. of lead (Table 3). Production from the Flin Flon mine was reduced in 1977 so that ore from Centennial and Westarm mines could be processed.⁴ In 1977, 1,588,619 tons of ore was produced. Ore grades were lower.

³ Canadian Mines Handbook 1977-78

⁴ HBMS Annual Report 1977

Table 3
HBMS Production by Mine Property

Mine	1977	Gold oz/ton	Silver oz/ton	Copper %	Zinc %	Lead %
Flin Flon	647,699	.042	.69	1.60	2.23	-
Anderson Lake	137,151	.027	.23	2.88	.18	-
Chisel Lake	242,248	.050	1.17	.74	9.24	-
Osborne Lake	240,703	.025	0.21	2.49	2.00	-
Dickstone	Closed August 1975					
Schist Lake*	15,320	.03	.9	3.0	6.0	-
Stall Lake	263,646	.026	.21	4.36	.18	-
White Lake	12,167	.028	.56	1.93	3.17	-
Ghost Lake	29,685	.056	.11	1.47	9.72	-
<hr/>						
1,588,619						

* 1976

Source: Canadian Mines Handbook 1977-78

The Centennial Mine, White Lake Mine, and Westarm Mine were brought into production during 1977/78.

Stall Lake Mine's ore production increased and was maintained at 22,000 tons/month. Diamond drilling to the 4600 ft. level indicated additional ore to be developed in 1978. Work has started on construction of a concentrator at the site.

Chisel Lake Mine produced on schedule at 242,248 tons. It is currently undergoing development work.

Ghost Lake Mine produced 29,685 tons, development of the Lost Lake ore body is from this mine at the 650 ft. level.

Anderson Mine was shut down in February 1978 to permit shaft deepening by 434 feet and a crusher was to be installed below the 3000 ft. level.

Proven reserves of copper-zinc in the Flin Flon-Snow Lake area totalled 17,511,100 tons, assaying gold, 0.036 ozs/ton; silver, 0.53 oz/ton; copper 2.75%; and zinc 2.7%.

Stack dust recovered from the smelter baghouse totalled 5,908 tons, assaying 28.5% zinc, 3.28% copper, 16.96% lead and 1.15% cadmium. Slag treated in the fuming furnaces totalled 358,776 tons yielding 30,063 tons of oxide fume containing 43,098,912 lbs. of zinc.

International Nickel Company (INCO)

In 1957 the beginnings of the western world's second largest nickel producing center was initiated. A fully integrated mining, smelting and concentrating complex along with a nickel refinery was constructed in Thompson. The concentrator facilities reached full production (6,000 ton daily capacity) late in 1961. Expansion continued until 1971 when economic slowdowns in Europe, United States and Japan resulted in a sharp decline in the free world demand for nickel. As world economy improved, sales for 1973 reached a new high as prices increased and mineral deliveries approached the record levels of 1970.

The Thompson mine located at the City of Thompson is the primary Inco property in Manitoba. The production shaft has a bottom level of 4330 feet. In 1966 No. 3 shaft was sunk to an initial depth of 2,067 feet and connected to Shaft No. 1 on several levels. Daily production of the mine is approximately 7000 tons.

In 1960-61 at the Pipe mine 20 miles SW of Thompson, Inco sunk an exploratory shaft at 600 to 1500 feet. In 1968 preparation of the open pit continued and Pipe No. 1 shaft was deepened to 1785 feet and Pipe No. 2 shaft sunk to 3061 feet in 1973. Production started in Pipe No. 1 and the open pit in 1970 with a projected capacity of 8000 tons daily. By December 1971 production in No. 1 shaft was suspended and open pit production reduced; present production is less than 7000 tons/day. Production from Pipe No. 2 was suspended in July 1977 due to a depressed world nickel demand and resulting inflated stockpiles of nickel.

Birchtree mine south of Thompson started production in 1969 at 4000 tons daily from the No. 1 shaft. The mine experienced limited

production in 1972. In 1975 work continued on deepening the shaft to 2,820 feet. Production was approximately 3,500 tons/day until work in the mine was suspended in December 1977.

Soab mine shafts saw production early in 1971, but is now dormant.

The International Nickel Company remains the world's leading producer of nickel and is the largest producer of copper in Canada. Its also ranks highly among producer of platinum and other by-products. Capital expenditures rose from \$149 million in 1974 to \$549 million in 1976 and dropped slightly in 1977 to \$433 million.⁵

As December 1977, Inco had proven ore reserves in Canada of 407 million short tons containing 6.9 million short tons of nickel and 4.3 million short tons of copper.⁶ Reserves in the mid-north account for 25 percent of the Canadian total.

Apart from the actual development of mineral resources in the Thompson nickel belt, Inco has had far reaching impacts on the mid-north. The city of Thompson was constructed by the company under an agreement with the Province of Manitoba. This agreement (signed December 3, 1956) provided for development and complete servicing of the townsite initially planned for 8000 people. At approximatley 21,000 persons in 1977, Inco remained the major employer in the city. Directly employing 1929 persons at the Thompson facility and another 259 at Birchtree. The company employs a total of 3300 people.

Sherritt Gordon Mining Company

The Sherritt Gordon Mining Company (SGML) holds two active mining properties in the Planning Zone, Ruttan and Fox Lake. Sixty-six percent of the companies capital expenditures for 1975 came from the Ruttan mine. Completion of an underground conveyor system from the 1000 foot level to surface and an underground access decline to the 1200 foot level accounted for a \$7,625,000 expenditure.

⁵ INCO 1977 report

⁶ INCO 1977 report; proven reserves are only those that have been sampled in sufficient detail to enable a reliable calculation of tons of ore and tons of contained metal.

The Sherritt Gordon property at Lynn Lake began production in late 1953 at 2600 tons daily, increasing to a daily capacity of 3500 tons by 1959. Early in 1975 the mine was classified as salvage and an attempt was made to mine out the remaining economic grade of nickel-copper ore. The mine was closed in June 1976.

Production at the Ruttan open pit commenced in early 1973 at 10,000 tons/day. This rate was reduced to 8000 tons/day in June 1975.

The Fox Mine property, approximately 30 miles southwest of Lynn Lake, has development at 400, 700, 1200, 1600, 2000 and 2100 feet levels. The mine was deepened in 1976 by extending the access decline from the 2200 foot level to 2400 feet. Production has been approximately 3000 tons daily since 1970 (a 25% reduction occurred in early 1976) (Table 4).

Sixty percent of the copper and zinc concentrates produced by Fox and Ruttan mines are shipped to HBMS Flin Flon for further processing, the balance goes to Japan (Table 5). A program of exploratory drilling on the entire Fox property was begun in 1976.

Negotiations between the Province of Manitoba and Sherritt Gordon in late 1970 resulted in the planning of a townsite for the employees, 16 miles west of the Company mine. Leaf Rapids is a precedent setting arrangement whereby all assessable surface property within the Local Government District of Leaf Rapids would be subject to taxation thus making SGML a taxable corporation.⁷ Sherritt Gordon currently employs 642 persons at the Ruttan Mine, representing approximately 67 percent of the estimated actual labor force of Leaf Rapids.

Agreements between SGML and the Provincial government concerning the development of the Leaf Rapids townsite and Provincial Roads 396 and 391 call for annual payments of approximately \$760 thousand dollars to the government until 1995. Repayment to Manitoba Hydro for cost of servicing the company's mining properties will continue to 2013.

In 1977, refined nickel production was down slightly to 26,688,000 pounds. Copper sulphide, a by-product of nickel refining, amounted to 2,507,000 lbs. In addition some 1,011,000 lbs. of cobalt was produced.

Total ore reserves for Ruttan and Fox amount to 37,532,000 tons grading 1.74% copper; 1.25% zinc.

⁷ In the past mining companies constructed towns and provided facilities in return for tax concessions.

Table 4

Sherritt Gordon Mine Production

	Ruttan 1976	1977	Fox 1976	1977	Lynn Lake 1976	1977
Ore milled (tons)	2,661,000	2,487,000	832,000	890,000	197,000	Closed June 1976
% Copper	1.08	1.13	1.56	1.46		
% Zinc	2.14	1.95	1.68	1.93		
Concentrates (lbs)						
Copper	50,067,000	50,341,000	24,232,000	24,042,000		
Zinc	93,097,000	78,250,000	18,904,000	24,841,000		
Cash	13.61	15.14	15.97	15.22		

Source: Sherritt Gordon Annual Report 1977

Table 5

Destination of Concentrates from Zone Mines 1977

Producing Property	Tonnage	Tonnage Concentrates	Destination
<u>Nickel</u>			
INCO Metals Ltd.	707,044	56,937	Thompson Smelter
Falconbridge Nickel Mines Ltd. Closed 6/77	8,036	1,030	Thompson Smelter
<u>Copper</u>			
Sherritt Gordon Mines			
Fox Lake Mine	48,918	12,283	Hudson Bay
Ruttan Lake Mine	37,554	9,310	Hudson Bay
	65,567	16,254	Noranda, P.Q.
INCO Ltd.	9,755	1,690	Thompson
	1,662	289	Copper Cliff
Hudson Bay Mining Smelting			
HBMS Conc.	203,947	36,921	Flin Flon Smelter
Residues	70,809	915	Flin Flon Smelter
Purchased	120,121	35,134	Flin Flon Smelter
Falconbridge Nickel Mines Ltd. Closed 6/77			
Manibridge	8,036	77	Thompson
<u>Zinc</u>			
Sherritt Gordon Mines Ltd.			
Fox Lake	24,069	12,299	HBMS
Ruttan Lake	49,948	25,289	HBMS
	22,448	11,365	Japan
<u>Lead</u>			
Hudson Bay Mining & Smelting	745	457	Trail, B.C.

Source: Personal Communication Lyle Skinner, Dept. of Mines, Natural Resources and Environment

Environmental Impacts

Since 1930, the Hudson Bay Mining and Smelting Company has been operating in Flin Flon. Initially, slag from the smelting operations was used for mine backfill purposes. As new ore bodies were discovered at Chisel and Stall Lake in 1956, these methods were no longer feasible. At the present time, mine tailings are deposited in an area formerly occupied by Flin Flon Lake. Tailings draining via Ross Creek into Schist Lake have had adverse affects on water quality. Increased levels of zinc, copper and lead have been noted in the water and high sediments, turbidity and carbon dioxide values were also found.⁸ There has been a reduction in numbers of fish and species found in Schist Lake as well as a presence of benthic fauna with known pollution status. The overall quality of plant effluent showed some improvements in 1975. Closure of the cyanide annex section of the mill, increased holding time in the tailings area and improved seepage control have had positive results.

Tailings from Sherrit Gordon mining operations at Lynn Lake have resulted in adverse affects on the Eldon River adjacent to the mine tailings area. High levels of toxic metals were found in the bottom sediments thus lowering fish production. Siltation by mine tailings has made the river impassable in some areas.⁹

Studies of the Grass River-Ospwagan Lake areas have shown that tailings from INCO Thompson have caused deterioration in environmental quality.¹⁰ There has been an increase in chemical loading of the water as a direct result of discharged dredge materials. Turbidity, color and dissolved solids have also increased, resulting in decreases in benthic production and variety.

The Manitoba Clean Environment Commission recently (August 1976) issued an Order-in-Council which would prescribe certain limits on the operation of the INCO smelter. Sulphur dioxide emissions are not to exceed 1250 tons/daily and particulate matter 19 tons per 24 hour day. The order also necessitates the construction (by INCO) of

⁸Cober, 1967

⁹Crowe, 1972

¹⁰Crowe, 1972

facilities needed to conduct a detailed stack sampling program.

Impact in the form of slag heaps, and vegetation destruction are site specific as well as general.

Government Programs

The Mineral Exploration and Development Subsidiary Agreement aimed at enhancing the development of the province's mineral resources was announced early in 1976. Increased employment and expansion of Manitoba's mineral industry are the goals of the four year program funded jointly by the Federal and Provincial governments. Work proposed under the agreement will include:

- investigations of known mineral occurrences to determine if better ore grades can be found leading to a profitable mining operation.
- evaluation of potential base metal deposits with diamond drilling where necessary.
- assessment of sand and gravel deposits, and other industrial minerals.

Recreation

The recreation industry in the Mid North Planning Zone has grown dramatically in recent years. A vast area of Northern Manitoba which once supported only a hand full of fly-in hunting and fishing camps is now dotted with marinas, campgrounds and cottages. Although the camps and lodges are still there and many are still fly-in, rapid expansion of the road system has been accompanied by an equally rapid expansion of other recreational facilities (Map 1).

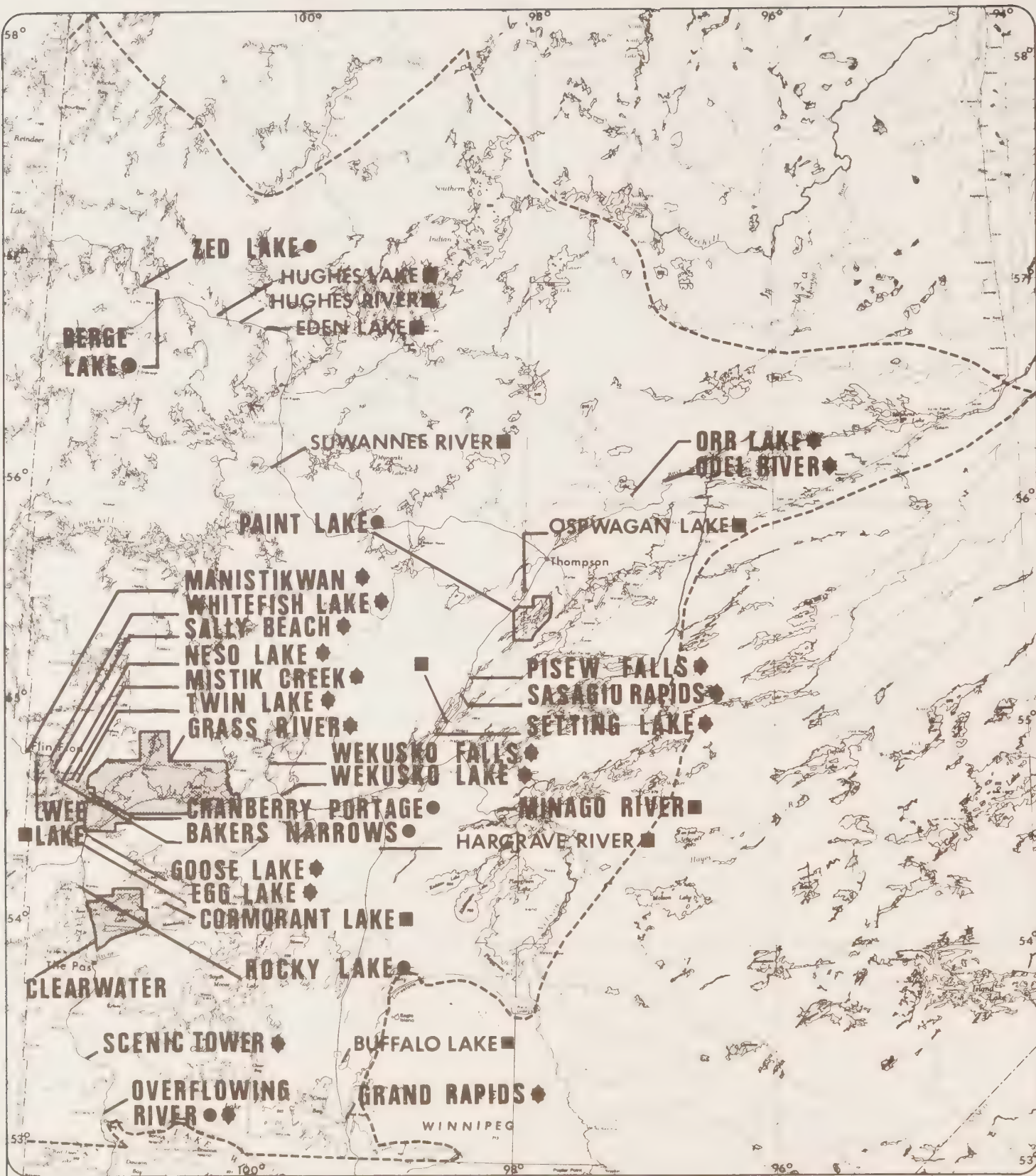
Recreation, including tourism, is an important aspect of the northern economy. A significant portion of the service industry (hotels, restaurants, etc.) is supported by the tourist-recreational trade.

Facilities

Existing government recreational facilities are primarily those shown on Map 1. These facilities are centered on the three major park areas, Grass River, Clearwater and Paint Lake. Grass River and Clearwater Lake natural parks account for 2896 km² of parkland while Paint Lake recreation area is 227 km².

There are 16 provincial campgrounds in the zone offering a variety of auxiliary facilities (Table 1) in addition to their 734 campsites. These seasonal sites combine with 1138 commercial accommodation units (Table 2) to give 1872 units at least on a seasonal basis. Some additional accommodation units such as overflow campsites are available for short periods of time. Thus the ability of existing accommodations to handle large numbers of visitors is limited and may be a serious limiting factor to increased tourism.

Other recreational facilities are available on a community specific basis. Arenas, gyms and curling rinks being fairly common while swimming pools, golf courses and downhill ski runs are found in and around the larger centers.



PROVINCIAL PARK FACILITIES

RECREATION PARK ●

NATURAL PARK ■

WAYSIDE PARK
(not designated)

WAYSIDE PARK
(designated) ◆

MAP 1

RECREATION

MID NORTH
PLANNING ZONE

1 inch:40 miles

Table 1

Mid North Campground Facilities^a

Campground	Lookout Towers	Boat Ramps	Playground	Swimming	Fishing	Dock	Camping Sites ^b
Bakers Narrows	1	2	Yes	Yes	Yes	3	87
Camper's Cove	-	1	-	Yes	Yes	1	55
Cormorant Lake	-	1	-	-	Yes	1	20
Cranberry Portage	-	2	-	Yes	Yes	2	22
Iskwasum	-	1	-	Yes	Yes	1	40
Overflowing River	-	-	-	-	Yes	-	35
Paint Lake	-	1	-	Yes	Yes	1	135
Pioneer Bay	-	1	-	Yes	Yes	1	79
Reed Lake	-	1	-	Yes	Yes	1	36
Rocky Lake	-	1	-	-	Yes	1	35
Simonhouse	-	1	-	Yes	Yes	1	12
Wekusko Falls	-	1	Yes	Yes	Yes	1	88
Berge Lake	-	1	-	Yes	Yes	1	30
Grand Rapids	-	-	-	-	Yes	-	15
Zed Lake	-	1	-	-	Yes	1	25
Manistikwan	1	-	Yes	-	Yes	-	20

Source: Manitoba Park Statistics 1976

^aThere are no trails, tennis courts, golf courses, museums, amphtheatres, ski lifts or miniature golf courses associated with any of the above campgrounds.

^bExcluding overflow sites.

Table 2

Commercial Accommodations in the Mid North Planning Zone

Location	Motels	Hotels	(Units)
			Lodges/Cabins
Athapapuskow Lake	0	0	61
Bakers Narrows	0	0	8
Clearwater Lake	0	0	38
Cranberry Lakes	0	0	36
Cranberry Portage	15	17	0
Cormorant	0	0	8
Elbow Lake	0	0	9
Flin Flon	79	65	10
Gillam	0	41	0
Grand Rapids	24	16	29
Ilford	0	20	0
Kississing Lake	0	0	20
Leaf Rapids	0	40	0
Lynn Lake	11	60	0
Manistikwan	0	0	7
Moose Lake	0	0	2
McGavock Lake	0	0	4
Norway House	0	16	0
Overflowing River	0	0	2
Payuk Lake	0	0	4
Ponton	4	0	0
Reed Lake	0	0	12
Rocky Lake	0	0	17
Sasagiu Rapids	0	0	10
Snow Lake	0	15	0
The Pas	112	108	0
Thompson	0	169	0
Vandekerckhove Lake	0	0	7
Wabowden	0	23	0
Wanless	6	0	2
Waskaiowaka Lake	0	0	5
Wekusko Lake	0	0	6
Total Units	251	590	297

Source: Department of Tourism, Recreation and Cultural Affairs, Manitoba Vacation Guide 1978-79.

Participation

Surveys done in 1970 by the Research and Planning Branch of the Dept. of Tourism have indicated that fishing is the singular most preferred recreational activity in Northern Manitoba (Table 3). Participation rates (which differ from preferences) in various activities indicate that pleasure driving, picnicing, walking/hiking and fishing are very popular (Table 4).

Some of the more common activities are discussed individually below. It is important to realize that each activity or a combination of several activities may combine to produce a pleasing recreational experience. For example, a passive recreational activity such as pleasure driving may be combined with an active pursuit such as hunting or skiing to produce the total experience.

Table 3

Activity Preferences of Recreators in
Northern Manitoba 1970
(Figures in Percent)

Activity	Winnipeg ^a Residents	Manitoba ^b Residents	Non-Manitoba ^c Residents
Fishing	27.0	69.0	81.1
Swimming	16.2	67.0	21.4
Boating	16.8	42.0	31.7
Canoeing	3.6	6.0	1.1
Waterskiing	2.4	3.0	4.4
Hunting	1.2	—	2.7

^a"Winnipeg Household Survey of Vacation Travel,"
Research and Planning Branch, 1970

^b"Norman Tourist Study," D. McCloy, 1970

^c"Tourist Reception Surveys, 1970," Research and Planning
Branch

Table 4.
Participation Rates in Selected Activities
(Percentage)

Activity	Manitobans		Canadians		
	1967	1972	1967	1969	1972
Hunting	12	13	14	13	11
Fishing	20	38	27	—	31
Boating	15	22	15	19	23
Canoeing	3	9	5	8	10
Skiing	2	7	6	7	7
Picnicking	37	59	42	54	54
Bicycling	7	26	—	13	19
Tent Camping	11	18	14	12	19
Trailer Camping	7	12	7	6	10
Pleasure Driving	48	69	52	—	65
Visiting Historic Sites	12	41	16	—	36
Snowmobiling	8	17	7	14	18
Swimming	—	24	39	44	—
Walking/Hiking	—	43	14	37	39
Golf	—	8	—	11	—

Source: Participation of Manitobans in Outdoor Recreation Activities, 1972, Neil Nixon, Dept. T.R.C.A. 1973.

Travel, Tourism and Outdoor Recreation, Statistics Canada, Catalogue No. 66-202, 1975.

PLEASURE DRIVING: Pleasure driving is apparently the most common recreational activity of Manitobans specifically and Canadians in general. Nearly seventy percent of Manitobans engage in pleasure driving. The zone provides extensive mileage of all-weather roads providing interesting and varied scenery. The road surfaces range from excellent blacktop to those capable of challenging the most adventuresome traveller. Visitors are able to see the full range of northern development from Hydro dams to mines as well as virtually untouched natural areas.

PICNICING: Picnicking is the second most popular recreational activity for Manitobans as well as other Canadians. Nearly sixty percent of Manitoban participate in picnicking. There are a number of designated and non-designated picnicking areas (wayside parks) as well as the recreation and natural parks which also include picnicking facilities. Little is known about these day users, particularly in the north. Discussions with Parks Branch field staff indicate a fairly high level of use of wayside/picnicking facilities. Picnicking often occurs in conjunction with pleasure driving, fishing, swimming and walking or hiking.

WALKING/HIKING: Nationally, hiking participation rates increased by 180 percent from 1967/1972, the highest rate of increase of any activity. Over 40 percent of Manitobans currently participate in walking and hiking activities. Formal hiking facilities in the Mid North Planning Zone are generally lacking, there is however, an interpretive trail at Pisew Falls.

FISHING: Angling has traditionally been the major recreational pursuit in northern Manitoba. As shown in Table 3 recreators, regardless of their origin, show a marked preference for fishing in the North. Approximately 38 percent of Manitobans participated in fishing in 1972. In 1977/78 there were 148,289 resident and 28,363 non resident angling licences issued in Manitoba.¹ On the average, about ten percent of Canadians and eight percent of Manitoba vacationers indicate fishing (and boating) as the principle vacation purpose.

Perhaps the best indicator we have of northern fishing popularity comes from the Provincial Master Angler Awards. In the past 12 years, master angler award fish have been taken in an average of 52 lakes per year. In fact over 26 percent of all award fish in the province are caught in the Zone (Appendix L). Planning Zone residents accounted for 7.6 percent of the Provincial awards indicating that over two-thirds of the award winning fish were caught by non-residents. Table 5 presents the last eight years of summarized award data in the best 20 Mid North lakes and rivers. These lakes and rivers account for about 78 percent of all master angler awards earned in the Planning Zone (Figure 1).

Creel census's have been carried out on a number of water bodies including Reed, Athapapuskow, Paint and Iskwasum Lakes and the Grass River. Game fish stocking in the Mid North has been carried out since 1941 in 30 lakes (Table 6).

¹ An additional 9,175 non resident three day licences were issued in 1977/78

FIGURE 1.
NUMBERS OF MASTER ANGLER AWARDS 1958-77

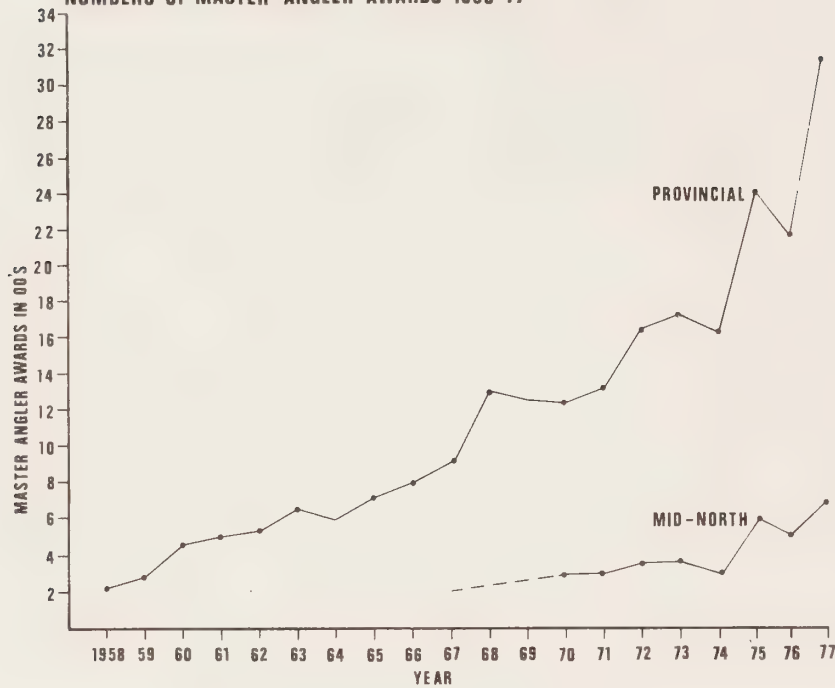


Table 5

Master Angler Awards in Best
20 Mid North Lakes and Rivers

Location	1970	1971	1972	1973	1974	1975	1976	1977	Mean	Percent of Zone Total
Reed Lake	29	52	43	76	46	51	56	87	55.0	12.0
Churchill River ^a	18	6	16	37	29	130	80	60	46.4	10.1
Athapapuskow Lake	39	40	48	39	45	34	40	50	41.9	9.1
Cedar Lake	43	6	26	16	14	38	13	42	24.8	5.4
Kississing Lake	18	4	7	22	45	26	29	45	24.5	5.3
Rocky Lake	9	12	24	30	20	28	23	26	21.5	4.7
Clearwater Lake	21	8	15	15	20	26	19	20	18.0	3.9
Cross Lake ^b	31	23	29	17	6	9	14	15	17.9	3.9
Cormorant Lake	34	24	21	17	14	12	8	11	17.6	3.8
3rd Cranberry Lake	16	42	51	7	3	2	1	4	15.8	3.4
Minago River	0	0	1	28	8	33	16	5	11.4	2.5
Saskatchewan River	5	10	20	14	8	12	13	5	10.9	2.4
Scotty Lake	6	6	29	7	2	6	7	6	8.6	1.9
Waskaniwaka Lake	3	16	24	13	3	0	0	0	7.4	1.6
McGavock Lake	2	0	7	3	9	4	17	12	6.8	1.5
Grass River	9	3	8	9	5	9	2	6	6.4	1.4
Odei River	0	0	0	0	0	0	0	51	6.4	1.4
Nelson River ^a	8	1	4	4	2	9	3	26	6.4	1.4
Eden Lake	2	2	0	1	0	6	6	30	5.9	1.3
Simonhouse Lake	4	3	7	2	8	5	5	12	5.8	1.3
Total	297	258	380	357	287	440	352	513	361	
Percent of Zone	79.0	73.3	79.3	82.6	74.9	71.1	72.9	78.6		78.3

Source: Master Angler Award Winners 1970-1977

^aMay include fish taken outside the zone.

^bMay include some fish from Cedar Lake (Cross Bay) due to problem in precisely identifying locations.

Table 6

Mid North Stocked Game Fish Waters to 1978^a

Lake	Location	Species ^b	Stocking	
			First Year	Last Year
Amhipod	Grass R. Park	RT	1972	1972
Amulet	E. of Flin Flon	RT	1966	1972
Athapapuskow	Cranberry Portage	BT, LT, RT, SM	1940	1968
Beaverhouse	E. of Flin Flon	K, RT	1963	1974
Borrow Pits (P.T.H.10)	S. of The Pas	BT, RT	1966	1974
Borrow Pits	Grand Rapids	RT	1978	1978
Bowden	Wabowden	K, W, LT	1951	1978
Clearwater	Clearwater Park	BT, K, LT, RT, S	1943	1973
Crater	Leaf Rapids	RT	1978	1978
Cross Bay (Cedar Lake)	N.W. Grand Rapids	LT	1967	1972
Digney	S.W. Lynn Lake	RT	1972	1978
Eating Point Creek	N. of Grand Rapids	BT	1971	1971
Gemmel	S.W. Lynn Lake	BT	1972	1978
Goose River	S.W. of Cranberry Portage	BT	1978	1978
Hill	N.E. of Thompson	RT	1978	1978
Kississing	N.E. of Flin Flon	LT	1964	1965
Korman	E. of Snow Lake	BT	1965	1978
Little Cliff	N. of Flin Flon	S	1973	1973
Leaf Rapids	N. of Leaf Rapids	RT	1974	1975
Manistikwan	E. of Flin Flon	BT, K, LT, RT, S, W	1941	1973
Mid Lake	S.W. of Thompson	BT, S, RT	1966	1978
Murry	N.E. of Bakers Narrows	S	1959	1969
Newman	W. of Cranberry Portage	BT, RT, S	1961	1975
Odei River	N.E. of Thompson	BT	1978	1978
One Portage	N. of Bakers Narrows	B	1972	1975
Overflowing River	S. of The Pas	W	1978	1978
Scotty	N. of Bakers Narrows	BT, RT	1960	1978
Two Portage	N. of Bakers Narrows	SM, RT	1971	1978
Upper Oswagan	S.W. of Thompson	S, LT	1971	1978
Webb	Grass River Park	RT	1978	1978

^aNo stocking in 1976 and 1977 due to hatchery disease problem^bAbbreviations for species are:

BT - Brook Trout

K - Kokanee

LT - Lake Trout

S - Splake

SM - Smallmouth Bass

W - Walleye

RT - Rainbow Trout

HUNTING: Hunting in the Mid North Planning Zone is predominantly centered on moose, geese and ducks. Hunting, is engaged in by about 12 percent of Manitobans, with little apparent change in recent years. It should be noted, however, that hunting has been showing a slight but steady decrease nationally. Activity preferences for hunting by Winnipeg and non-Manitoba residents in the north are low when compared to activities such as fishing, boating and swimming.

The hunting pressure (man days of hunting) for all hunting types is estimated to be over 150 thousand user days for northern Manitoba (Table 7).

Migratory game bird hunting in northern Manitoba has been steadily increasing in recent years with the 1976 harvest estimated at over 135 thousand ducks and geese (Appendix J). This is the most popular hunting form with over 90 thousand user days or about 60 percent of all hunting.

Moose is the most popular ungulate hunted due no doubt to high moose populations and the relatively low deer populations. The highest pressure (and success rate) is found in the vicinity of The Pas, particularly game hunting areas 6, 6A, 8, 11 and 12 (Map 2).

The Pas area had received about 1.2 percent of the provinces deer hunters in 1974. These hunters had to expend more effort in order to obtain their deer and were somewhat less successful than the provincial average. There has been no white tail deer season in northern Manitoba since 1974.

Data for upland game bird hunting was collected only from 1971 to 1975 when it was discontinued due to surveying problems. Upland bird hunting user days may be double counted in the totals in Table 7 due to the likelihood that this hunting form is often carried out in conjunction with other types.

Table 7

Estimated Hunting Pressure in Northern^c Manitoba
(in ,000 of User Days)

Type	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Resident Moose	12.2	12.0	12.0	17.5	24.7	24.7	21.9	15.3	15.2	28.1
Non-Resident Moose	3.5	5.6	5.0	8.3	11.5	10.5	1.2	.5	.8	1.0
Deer	1.5 ^a	1.5 ^a	2.9 ^a	4.6	5.4	3.9	—	no hunting	—	—
Caribou	.3	.6	.6	.6	1.0	.5	.4	.3	.5	.2
Upland Game Bird	[4.8] ^f	[8.7] ^f	[11.0] ^f	15.5	18.2	18.7	27.8	24.4	[28.5] ^e	[31.5] ^e
Migratory Game Bird ^b	15.7	16.0	15.3	47.6	21.5	55.4	61.8	83.6	90.3	[93.9] ^d
Total User Days	38.0	43.7	46.8	94.1	82.3	113.1	113.7	124.2	135.3	155.8

Source: Personal communication P. Page and D. Cross, Department of Mines, Natural Resources and Environment and Canadian Wildlife Service

^a Resident only

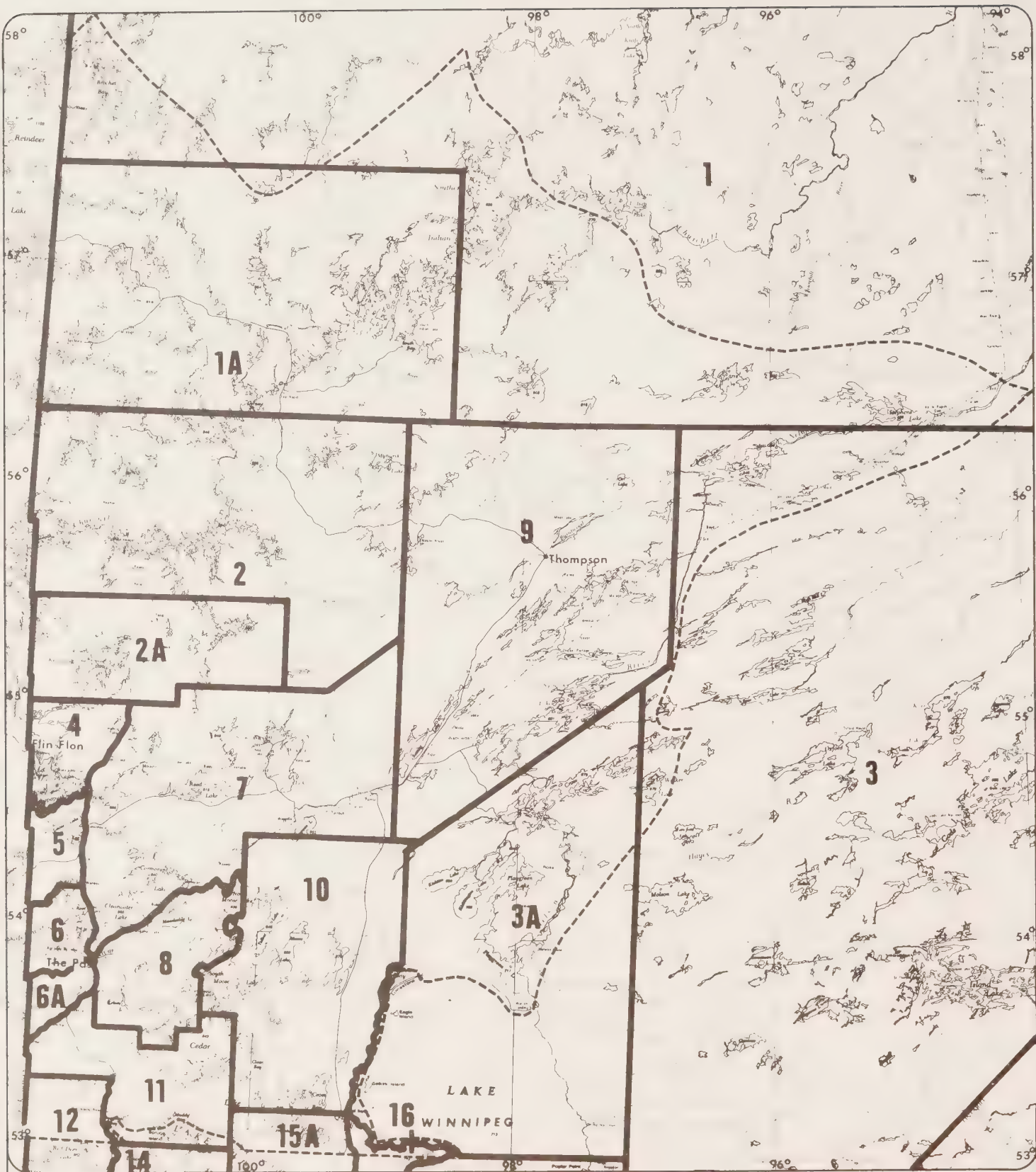
^b Estimates from Canadian Wildlife Service

^c Northern is defined differently for ungulates, upland and migratory game birds but generally includes all Manitoba north of 53°N

^d Data unavailable at this time, this figure represents a linear projection

^e Figure represents a projection as surveys no longer carried out

^f Estimates as no surveys carried out



GAME HUNTING AREA BOUNDARIES

**MAP 2.
RECREATION**

**MID NORTH
PLANNING ZONE**

1 inch:40 miles

COTTAGING: In November, 1978, there were 1291 occupied cottage lots in the Mid North,² predominantly located in the southern and southwestern part of the Zone (Table 8). Approximately 2.6 percent of the adult population own or lease cottages in contrast to 3.5 percent for Winnipeg residents.³ There has been an increase of nearly 25 percent in occupied cottage lots since 1976, the majority of which are held by local residents.

²Excludes isolated cottages and squatters

³Nixon, 1972

Table 8
Cottagers by Origin and Location

Location	Total ^b Lots (1978)	Lots Occupied		Local ^a Residents	Percent		
		1976	1978		Other Manitobans	Other Canadians	Americans
Aimee L.	3	0	3	33.3	0	0	66.7
Athapaskow L.	319	281	304	86.4	7.6	3.0	3.0
Clearwater L. ^d	373	342	354	83.1	10.7	4.8	1.4
Berge L.	64	39	37	91.9	5.4	0	2.7
Cross Bay (Cedar L.)	14	0	13	84.6	15.4	0	0
Eden L.	23	0	2	100.0	0	0	0
First Cranberry L.	10	9	10	90.0	10.0	0	0
Hughes L.	15	0	2	100.0	0	0	0
Manistikwan L.	132	113	128	96.1	1.6	2.3	0
Paint L.	134	132	130	96.9	2.3	0.8	0
Payuk L.	7	6	6	83.3	0	0	16.7
Rocky L.	80	0	75	100.0	0	0	0
Schist L.	23	23	22	86.4	9.1	4.6	0
Setting L.	176	66	143 ^c	89.5	1.4	1.4	0
Wekusko L.	44	7	35	94.3	5.7	0	0
Zed L.	31	26	27	100.0	0	0	0
	1448	1044	1291	89.2	6.0	2.6	1.4

Source: Personnel Communication; Parks Branch, Northern Region, November, 1978

^aLocal is defined as less than 75 driving miles from site

^bIncludes lots vacant, reserved, or cancelled but on file

^cIncludes 11 lots where addresses were not available

^dIncludes 72 private lots

CAMPING: In the period from 1971 to 1976, northern provincial campgrounds have increased the number of user days sold by an average of 5.6 percent per year (Figure 2). In the same period, due to increases in season length and number of sites, the percent occupancy has fallen (Table 9). Northern campers are generally more often from the United States than from other Canadian Provinces and are less frequently Manitobans than the provincial average (Table 10).

FIGURE 2.

NUMBER OF UNIT DAYS SOLD IN NORTHERN
PROVINCIAL CAMPGROUNDS

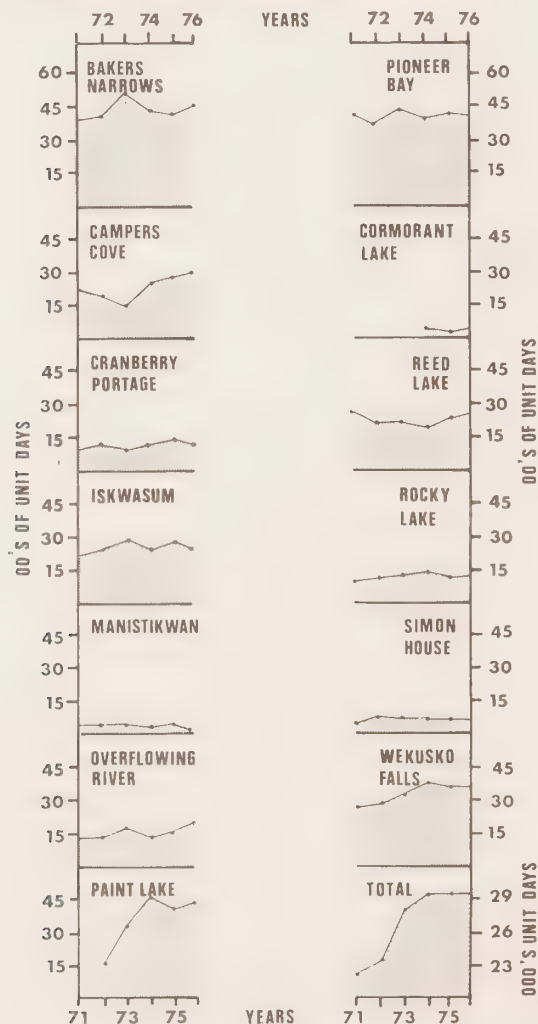


Table 9

Provincial Campground Use Statistics
Northern Region

	1971	1972	1973	1974	1975	1976	Average	
							% Change 1971-76	Annual % Change
Season length (days)	113	115	139	136	138	137	+ 21.2	+ 3.5
No. of campsites	325	392	405	460	613	734	+125.8	+21.0
Potential user-days	36,725	45,080	56,295	62,560	84,594	100,558	+173.8	+29.0
User-days sold	22,302	23,774	28,278	29,979	29,795	29,849	+ 33.8	+ 5.6
No. of permits sold	9,519	10,922	13,434	13,646	14,908	14,437	+ 51.7	+ 8.6
% Occupancy	60.7	52.7	50.2	47.9	35.2	29.7	- 35.2	- 5.2

Source: Manitoba Park Statistics 1971-1976

Table 10

Origin of Campers
(In Percent)

	1967		1968		1969		1970		1971		1972		1973		1974		1975		1976		Mean	
	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P	M	P
Mid-North	50	50	51	49	52	48	51	49	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Mid-South	15	15	16	14	15	15	16	14	15	15	16	14	15	15	16	14	15	15	15	15	15	15
East	35	35	33	37	33	37	34	36	35	35	34	31	35	35	34	34	35	35	35	35	35	35

M: Mid North Campgrounds

P: Provincial Average

Potential

The land capability for recreation, a part of the Canada Land Inventory (CLI) program, has been completed south of the 55th parallel and west of the principal meridian. Map 3 shows the summarized capability rating for that portion of the zone completed by CLI.

In addition to CLI capability rating, the Pilot Land Use Planning project (PLUP) determined the capability rating for the area known as The Pas Special Area (Map 4). This capability rating system included CLI as well as a variety of other characteristics such as access and wildlife populations. Areas of particular importance, as identified by PLUP, were Athapapuskow and Clearwater Lakes.

Apart from CLI and PLUP, which cover much the same area of the Planning Zone, there has as yet, been no coordinated regional approach to determine recreational capability or suitability. Other determinations of recreational potential have been on a project by project or site specific basis.

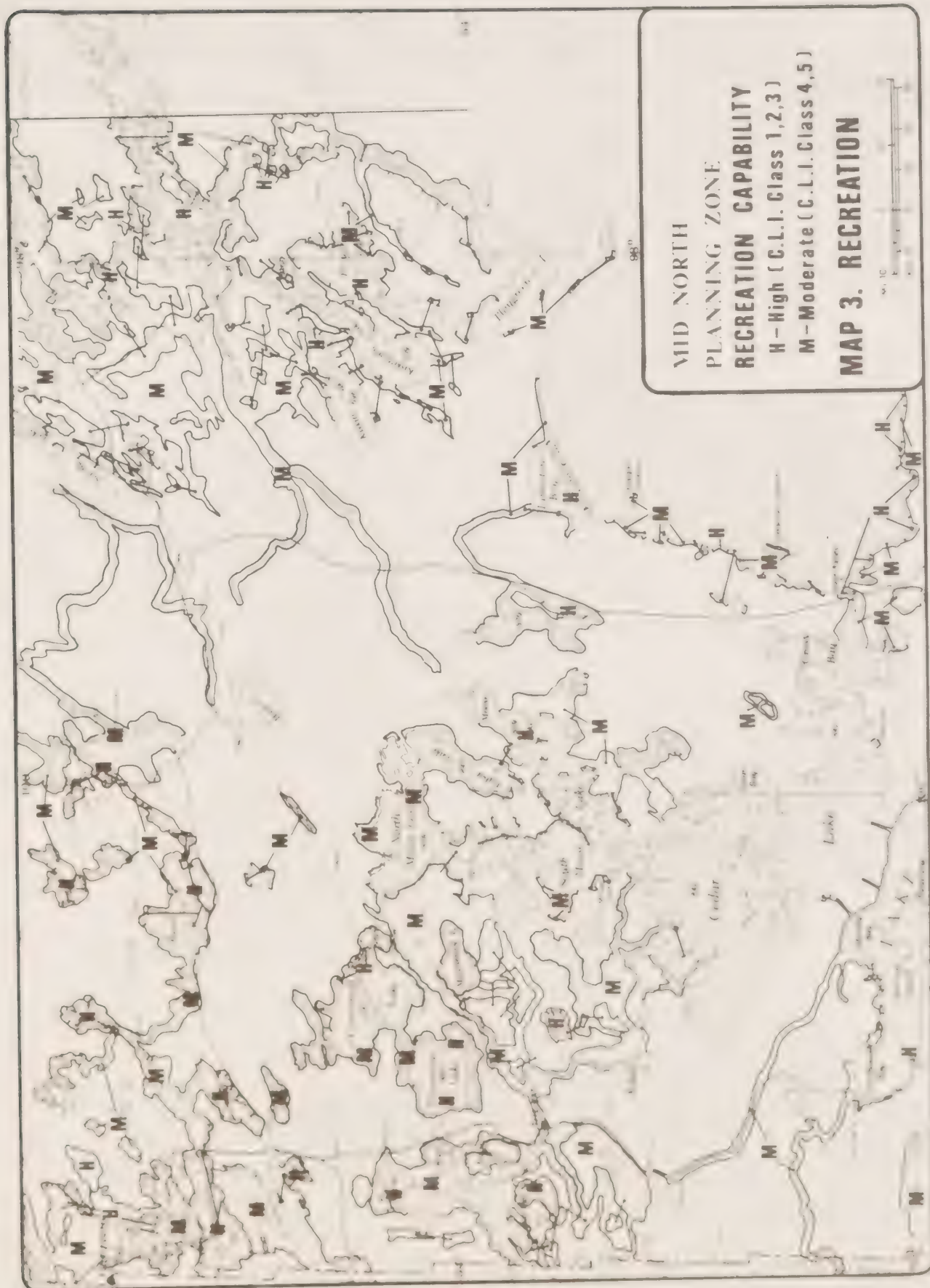
The following section will attempt to summarize the findings of some of the more significant reports by area (Map 5a and 5b).

- 1) SOUTHERN INDIAN LAKE:⁴ Although the lake is representative of the Northwest Boreal Uplands Natural Region, it is considered incompatible for national park status with the present level of commercial fishing.⁵ Should the river diversion significantly alter the native biota there would be no possibility for national park interest in the lake. The possibility of a provincial wilderness park is rejected for much the same reasons as the national park in addition to the moderate level of mechanized development which is evident on the lake (tugs, barges, float and ski planes etc.).⁶ A large provincial natural park is generally rejected due to the lack of major scenic areas, unique landforms, vegetation or animals, and the average scenery for the region. Generally, Southern Indian Lake does possess a potential for cottaging but is probably best suited, at present, to limited extensive recreation (fishing, hunting, boating and camping).

⁴Recreation Study South Indian Lake, Parks Branch, 1973

⁵As defined by the National and Historic Parks Branch

⁶As defined by Parks Branch, Department of Tourism, Recreation and Cultural Affairs, June, 1974



MAP 4. RECREATION

Mid North Planning Zone

THE PAS SPECIAL AREA RECREATION CAPABILITY

INTENSIVE USE

HIGH

MOD

MOD-LOW

1

2

3

4

5

6

7

EXTENSIVE USE

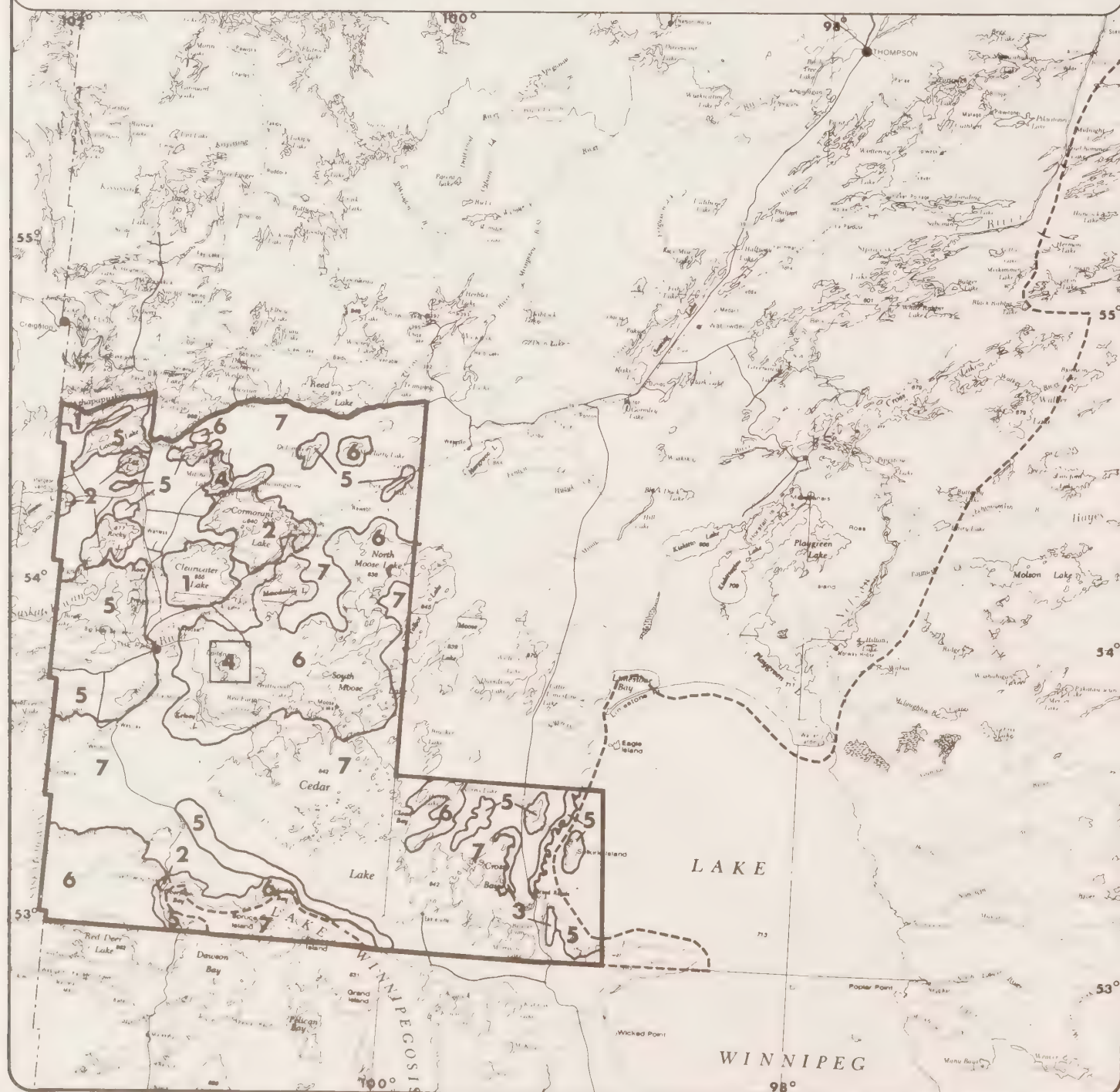
HIGH

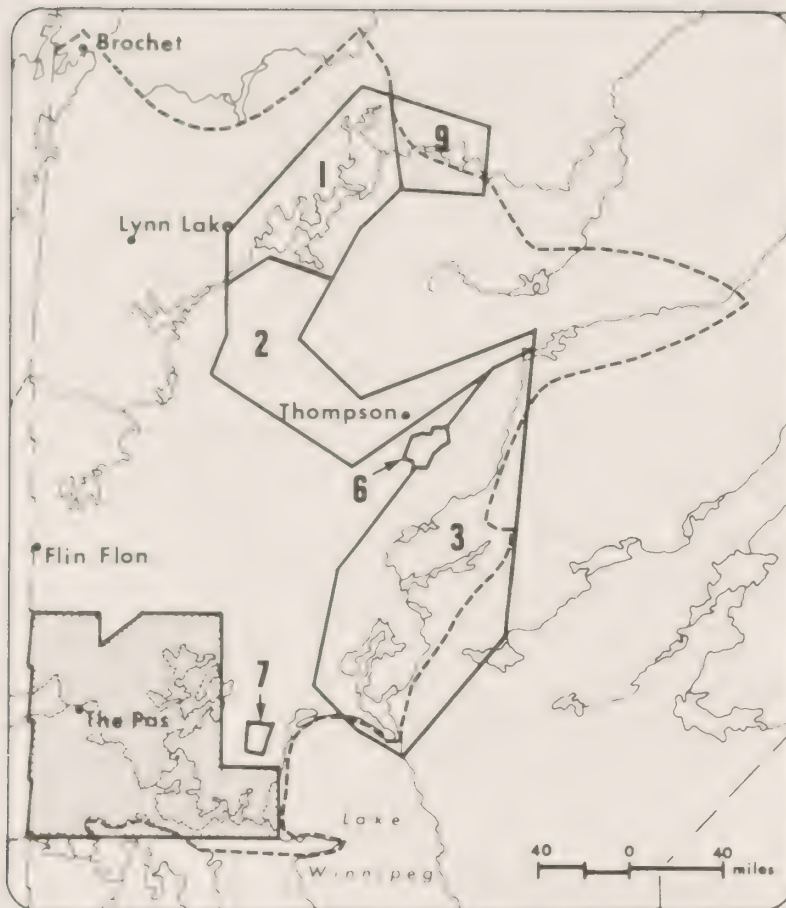
MOD

MOD-LOW

LOW

Miles 10 0 10 20 30 40

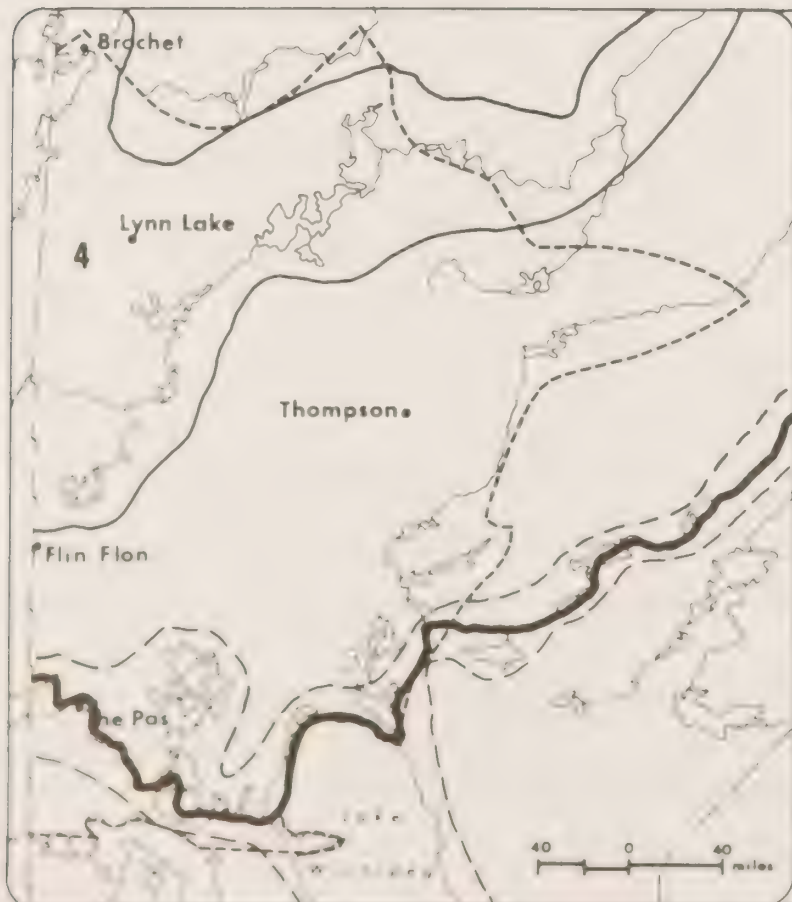
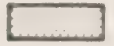




MAP 5A. RECREATION

STUDY AREAS
(NUMBERS SAME AS IN TEXT)

THE PAS SPECIAL
AREA (P.L.U.P.)



MAP 5B. RECREATION

HISTORIC WATER ROUTE

ENVIRONMENT CORRIDOR

STUDY AREA

NUMBERS SAME AS IN TEXT

- 2) RAT AND BURNTWOOD RIVERS:⁷ The entire diversion route, in its natural state, has a high potential for wilderness canoeing, camping, fishing, hunting, nature study and photography. With Hydro diversion, most of the wilderness aesthetic and scenic qualities of the rivers will be lost. Recreational activities along the rivers will probably be limited to boating, fishing and picnicing.
- 3) NELSON RIVERS (NORWAY HOUSE TO SPLIT LAKE):⁸ In its natural state, the lakes and rivers in this area have a low potential for extensive recreation. After the completion of hydro construction, it is anticipated that the Jenpeg control structure will become a visitor attraction due to the recent controversy and publicity. Angling in the tailrace and forebay near Jenpeg is likely and thus picnicing, camping facilities and boat launches will be required.⁹ If the Minago River is not too severely affected by flooding it may possess (as it does at present) excellent potential for boating, angling, camping and hunting. Recreation potential of Cross Lake, Pipestone Lake and Ross Island is likely to be severely inhibited by Hydro construction.¹⁰ The Sea River Falls/Norway House area (East Channel) currently possesses and will continue to have excellent potential for camping, canoeing and photography. There is also historic potential both at Norway House and the route to York Factory from Norway House.
- 4) CHURCHILL RIVER BASIN:¹¹ There is a recognized potential for canoeing on the Churchill River from Sispuk Lake to Leaf Rapids. Areas in the Churchill River Basin are under consideration by national and provincial parks (1972).
- 5) SASKATCHEWAN AND ECHIMAMISH RIVERS:¹² The Saskatchewan River is considered to have significant recreational potential due to the historic, archaeological, and biophysical sites found along its banks. It is being considered as an historic and scenic water route. Map 5b shows the location of the Saskatchewan River and the Echimamish/Hayes River historic water routes and the proposed environmental corridor.

⁷ Recreation Study Rat-Burntwood Diversion Route, Parks Branch, 1974

⁸ Recreation Study Outlet Lakes, Parks Branch, 1973

⁹ Provided boating becomes feasible by clearing floating and submerged debris

¹⁰ Cross Lake and Pipestone Lake presently possess low potential for recreation activities

¹¹ Churchill River Basin Task Force, August, 1972

¹² Byways and Special Places Program, Parks Canada, 1973

- 6) PARTRIDGE CROP LAKE AREA:¹³ In 1972 the area around Partridge Crop and Natawahunan Lakes was proposed as a provincial park. The area is considered to have a high potential for camping, canoeing, boating and associated extensive recreation forms. This area is currently under Parks Branch reservation.
- 7) LITTLE LIMESTONE LAKE:¹⁴ Three sections of shoreline on Little Limestone Lake area are considered to have potential for recreational development. Cottaging, camping, hiking, picnicing, boating and fishing are recommended by the consultants report for the lake.
- 8) PROVINCIAL ROAD 391:¹⁵ Significant recreational potential is shown in the Eden Lake area, Granville Lake area, Nelson Lake, Churchill River area and Wapisi Lakes area. A number of recreational features and components are mapped and the level of interaction (simulation modeling) is determined.
- 9) LOWER CHURCHILL STUDY AREA:¹⁶ The lower Churchill River has been designated as a modified waterway with an ecological reserve containing sensitive ecosystems. Potential for guiding and canoe outfitting exists on the Deer River. Cottaging presently exists upstream from Churchill, however reduced flows may hamper further development.

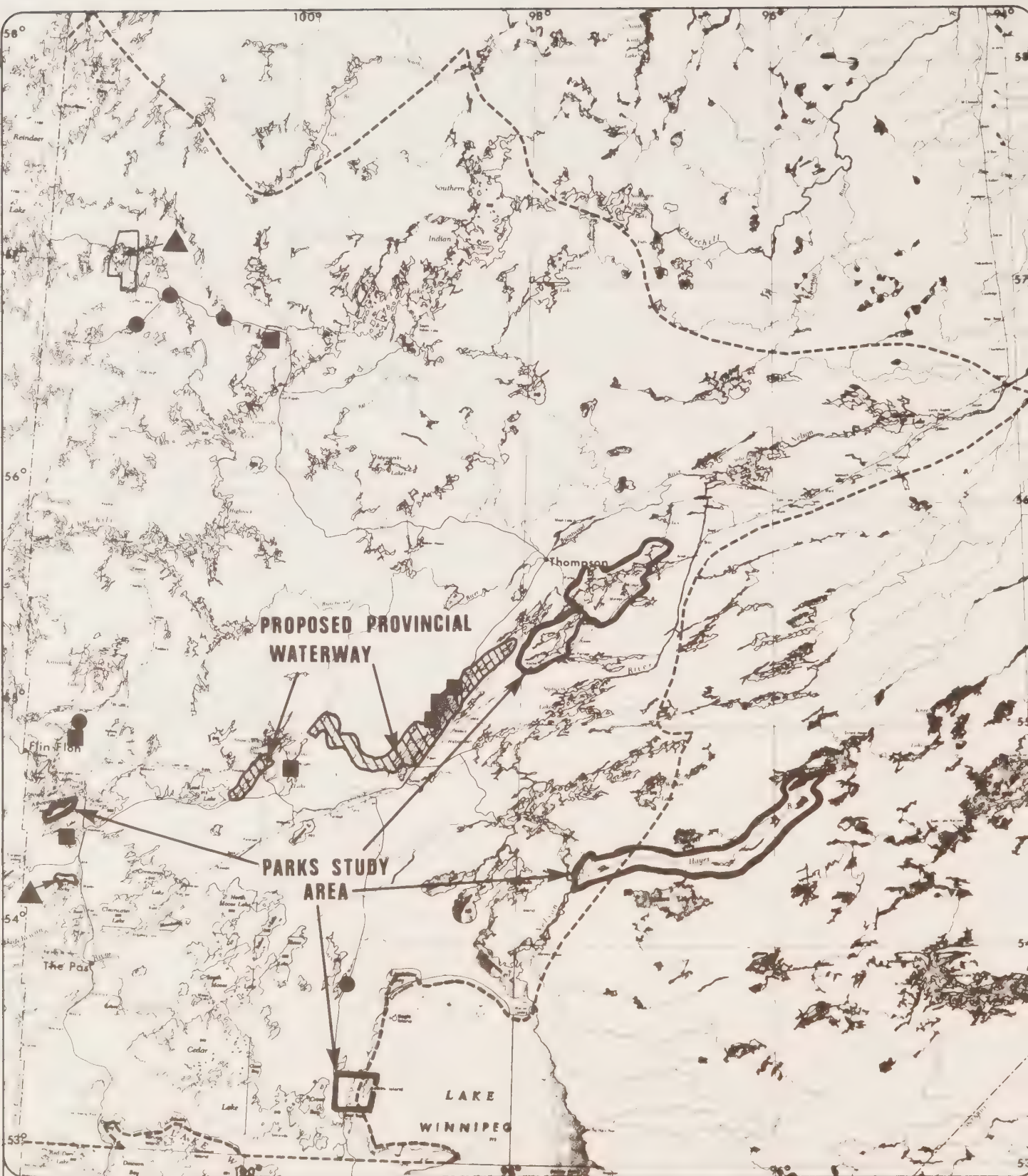
The provincial Parks Branch has assessed a number of sites in order to evaluate their inherent potential for recreational use. The locations shown on Map 6 are some of the proposed sites resulting from their investigations and some of the areas currently under consideration.

¹³ Partridge Crop Lake Provincial Park, Parks Branch, 1972

¹⁴ Report on Proposed Development at Little Limestone Lake, Manitoba
P.M. Associates Ltd., 1973

¹⁵ An Environment Motivated Plan For Multiple Resource Use Along Highway 391. A. Daken, H. Jackson, D. Johns, 1973

¹⁶ Recreation Assessment Lower Churchill River, Parks Branch, 1974



PROPOSED FACILITIES

- PROPOSED WAYSIDE
- LAND RESERVATION
- ▲ PROPOSED PROVINCIAL PARK

MAP 6. RECREATION

MID NORTH
PLANNING ZONE

1 inch: 40 miles

Water Resources

The use of Manitoba's water resources has increased rapidly in recent years being used for power generation, recreation, commercial fishing, trapping and for domestic purposes. Water used by communities for domestic reasons is obtained from a variety of sources (Table 1). Generally, domestic water use is a minor user of the total water resource.

Table 1

Domestic Use of Water in The Mid North Planning Zone

Communities utilizing river water		Communities utilizing lake water	
Community	River	Community	Lake
The Pas	Saskatchewan	Flin Flon	Cliff
Grand Rapids		Lynn Lake	Lynn
The Pas Reserve		Snow Lake	Snow
Norway House	Nelson	Wabowden	Bowden
Split Lake		Cranberry Portage	Lake Athapapuskow
Gillam		Cormorant	Cormorant
Leaf Rapids	Churchill	Sherridon	Sherlett
Pukatawagan		Brochet	Reindeer
Thompson		Granville	Granville
York Landing		South Indian	Southern Indian

Major Users

The mining industry uses water in two ways; in the mining, smelting process and water power for electricity. The second of these is more important as all producing mines in the Zone are powered by hydro-electric power. Lynn Lake, Ruttan and Fox Mines and all mines in and around Thompson receive their power from Nelson River generating stations (Kelsey and Kettle). Flin Flon and Snow Lake receive power from Island Falls Saskatchewan. Direct mining use of water is a locally important factor. Although mines and processing equipment may have far reaching effects on local water quality and water supply, these effects are at present minimal on a regional basis.

The Saskatchewan River supplies water for the many phases of MANFOR'S industrial operations in The Pas. Effluent discharged from the plant is returned to the river with its increased chemical load.

Recreational water use is at present of an extensive nature throughout the Zone.¹ Certain areas of intense use are, however, evident. Lakes around the larger centers are receiving moderate to heavy use. Clearwater, Reed, Athapapuskow, Rocky, Paint and Berge Lakes are receiving the brunt of recreational use in the Zone. Recent road construction has increased the accessibility of a number of water bodies and will result in expanded recreational pressure.²

Commercial fishing is also a user of water resource. Waters which are commercially fished in the Zone are shown on Map 1 and the section entitled Fisheries Resources discusses locations and intensity of use in detail.

The principal user of water resources in the Mid North Planning Zone is Manitoba Hydro. Hydro is also the only user approaching its maximum potential use from a regional basis. Five generating stations are in operation (Table 2) and three more are to be operational within the next two years. By 1995, all major potential generating sites in the Zone should be completed. These structures should yield over 7.2 million kilowatts of power.

Map 2 shows the extent of Hydro's water reserves in the Mid North. These reserves have been granted Hydro for work on the Churchill River Diversion, Lake Winnipeg Regulation and the core of Hydro's northern development, the Nelson River.

The Zone has five artificial impoundments, the largest ones being Cedar Lake, Reindeer Lake and Stevens Lake. Two small reservoirs are located on the Laurie River. Locations of Hydro structures existing and proposed are shown on Map 3. Characteristic impacts of the existing impoundments are dealt with in Appendix K.

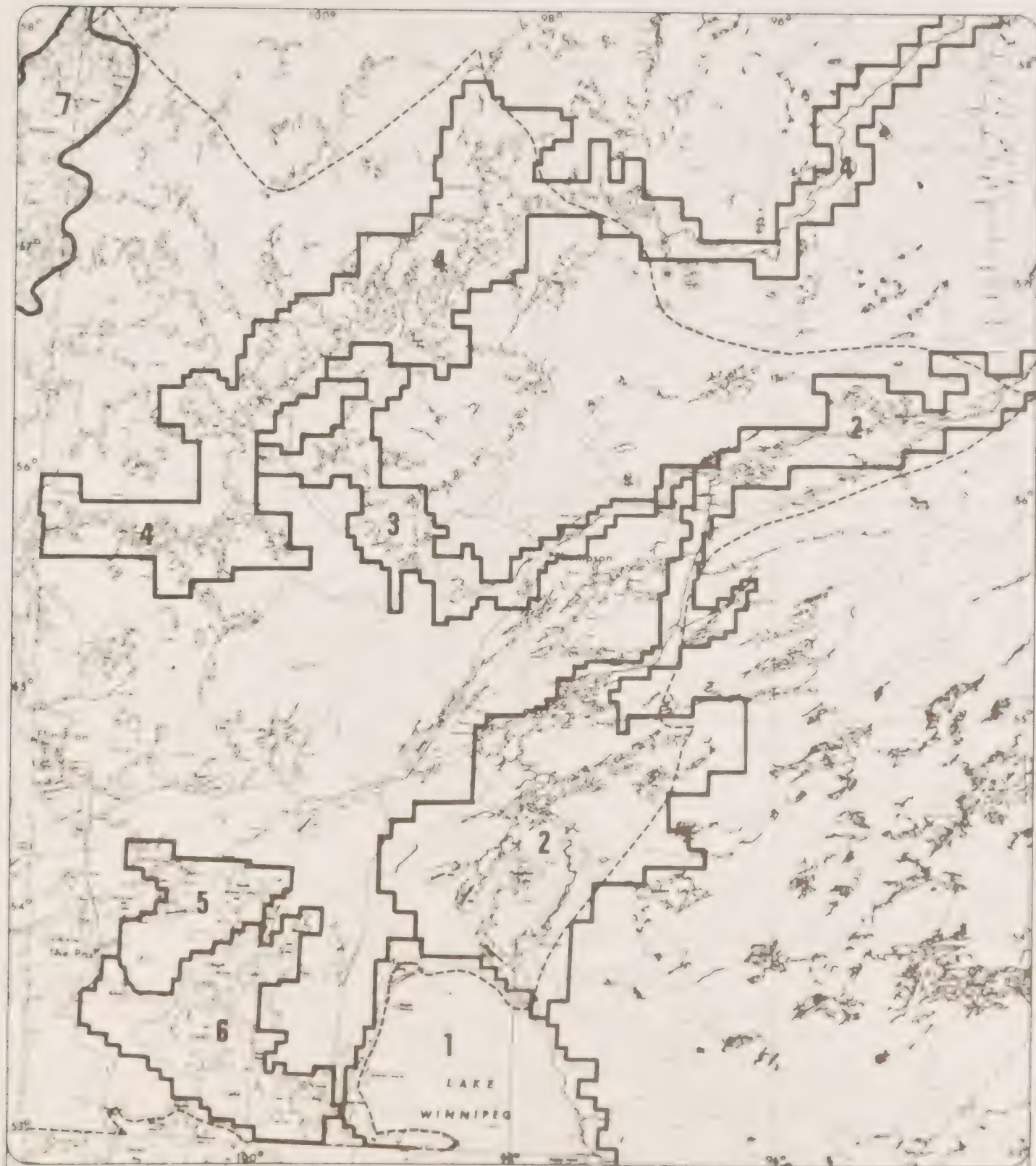
¹ See section on Recreation

² Such as the Thompson-Lynn Lake Highway, Road to Jenpeg and the Road to Kississing

Table 2
Hydro Generating And Control Structures

Dam	Dam Operational	Power	Normal Head (Feet)
1. Laurie R. #1	1950	7,000	55
2. Laurie R. #2	1950-55	10,000	55
3. Missi Falls	1975-76	Control	
4. Notigi	1975-76	90,000 Kw (Potential)	30-40
5. Wuskwatim	Proposed (1990)	320,000 Kw	93
6. Manasan	Proposed (1991)	164,000 Kw	58
7. First Rapids	Proposed (1991)	167,000 Kw	55
8. Kelsey	1960	320,000 Kw	50
9. Kettle	1970	1,224,000 Kw	98.5
10. Long Spruce	1977	970,000 Kw	80
11. Upper Limestone	1982	1,000,000 Kw	80
12. Jenpeg	1976	168,000 Kw	25
13. Kiskitto Dam	1976-77	Control	
14. Grand Rapids	1968	472,000 Kw	125
15. Bladder Falls	Proposed (1994)	423,000 Kw	61
16. Upper Gull	Proposed (1995)	465,000 Kw	45
17. Lower Gull	Proposed	450,000 Kw	45
24. Lower Limestone	Proposed (1985)	1,000,000 Kw	80
- Gillam Island	Proposed (1987)	1,000,000 Kw	80
19. 2 Mile Channel	1976-77	Control	
20. 8 Mile Channel	1976-77	Control	
18. Kiskitto-Minago Drainage Channel	1976-77		
22. Ominawin By-Pass		Control	
23. South Bay Diversion Channel	1976	Control	
21. Stan Creek Diversion Channel	1976-77		

Note: Numbers refer to Map 3



WATER POWER RESERVES

LAKE WINNIPEG

NELSON RIVER

BURNTWOOD RIVER

CHURCHILL RIVER

SASKATCHEWAN RIVER-BRAND RAPIDS PROJECT

GRAND RAPIDS POWER DEVELOPMENT SEVERANCE LINE

REINDEER LAKE LICENSED STORAGE RESERVE

MAP 2.

WATER RESOURCES

- 1
- 2
- 3
- 4
- 5
- 6
- 7

MID NORTH
PLANNING ZONE

1 inch 40 miles



HYDRO GENERATING AND CONTROL STRUCTURES
DRAINAGE AND DIVERSION CHANNELS
EXISTING CONTROL STRUCTURES

HYDRO GENERATING STATION (EXISTING)
 (PROPOSED)

NOTE: EXPLANATION OF NUMBERS—TABLE 2.

MAP 3.
WATER RESOURCES

MID NORTH
PLANNING ZONE

1 inch:40 miles

Economic Factors

Water is the fundamental resource upon which many resource users depend. Social and economic factors pertaining to each industry are dealt with in that industries particular section (e.g., Fisheries Resources). The only exception to this being Hydro; factors relating to Hydro are discussed in this section.

Manitoba Hydro's electrical generating program is, and probably will continue to be for the next twenty years, the most significant single land use in the Mid North. The following points will serve to highlight the variety and extent Hydro's northern influence:

- 1) Manitoba Hydro supplies power for mines at Thompson, Lynn Lake, Ruttan and Fox Lake,
- 2) Stimulates road construction such as the all-weather road to Jenpeg and the road to South Bay,
- 3) Provides power either by transmission lines or diesel generators to all zone communities,
- 4) Constructed the towns of Gillam and Jenpeg, and the expansion of Bird is under way,
- 5) Employs men in the Mid North on construction and maintenance of power facilities (Table 3),
- 6) Through its water power reserves is the single largest agency influencing land-use outside the Crown Lands Branch,
- 7) With its dams, channels, diversions and artificial reservoirs has the highest environmental impact in the Mid North Planning Zone, and
- 8) During the summer 1975 commercial fishing season, Manitoba Hydro totally subsidized fishermen using lakes that would be adversely affected by the Churchill River Diversion.

As can be seen by the preceding points, Hydro's influence whether direct or indirect is substantial. Hydro employs a number of local northerners in its construction projects and in so doing raises the local level of skilled labour. Hydro has a significant effect upon the traditional life of local northerners by making 'wage work' on projects available. The repercussion of such employment are felt in the traditional primary industries, such as trapping and commercial fishing. Young people from communities such as Cross Lake and Nelson House are apparently abandoning traditional skills in favour of work such as offered by Hydro.

Table 3

Manitoba Hydro Employment in The Mid North^a

Project	Date	# of Men Employed		
		local ^b	non-local	total
Long Spruce	July 1975	213	1316	1529
	January 1976	149	742	891
	November 1976	N/A	N/A	183
Jenpeg	February 1976	183	234	417
Channels	February 1976	N/A	N/A	22
Lake Winnipeg Regulation	November 1976	N/A	N/A	84
Notigi	September 1975	54	176	231
	February 1976	5	31	36
	November 1976	N/A	N/A	0
South Bay	February 1975	89	503	592
	February 1976	10	284	294
Missi Falls	February 1976	30	105	135
South Bay, Missi, Thompson	November 1976	N/A	N/A	47
Kettle Rapids	July 1975	41	194	235
	January 1976	20	115	135
Limestone	November 1976	N/A	N/A	112

Source: Manitoba Hydro; Personal Communications

^aFigures are for construction of power facilities only. Maintenance crews and community operations are not included in the total.

^bDefinition of local varies from site to site

Hydro's influence also extends into some communities in a physical way. Table 4 outlines some of the alterations occurring as a result of changes in water regimes and flows.

"Manitoba Hydro has developed plans for a multi-billion dollar development of the Churchill and Nelson Rivers in Northern Manitoba. The power production capacity is of a similar order of magnitude as the La Grande hydro-electric development proposed for the James Bay area, Quebec and the recently completed Churchill Falls hydro-electric development, Labrador. The completed development would constitute 14 power stations." ⁵

⁵Lake Winnipeg, Churchill and Nelson Rivers Study Board, July, 1974
Winnipeg, Vol. 1 Technical Report, Appendix 2, page 7.

Table 4

Physical Impact of Hydro Development on Zone Communities

Community	Impact
Cross Lake	<ul style="list-style-type: none"> - Changes in water regime could change fish migration patterns and decrease spawning areas of the Cross Lake fisheries - Poor ice conditions could disrupt winter road transportation
South Indian Lake	<ul style="list-style-type: none"> - Increase water levels, flow and debris could severely decrease fish productivity and hamper the commercial fishery - Homes, docks and other structures could be affected by rise in water levels
Norway House	<ul style="list-style-type: none"> - Water regime changes and debris on Playgreen Lake could result in hazardous navigation and fishing operations - Stability of the winter road would be questionable
Ilford	<ul style="list-style-type: none"> - Commercial fishery operations of the community may no longer be viable due to reduced flows on the Churchill River
Thompson	<ul style="list-style-type: none"> - Debris accumulated on the Burntwood River could hamper recreational angling and skiing - High water levels could affect water intake systems in the community

Source: Social and Economic Impact Study Lake Winnipeg, Churchill-Nelson Rivers Hydro Development, June 1974.

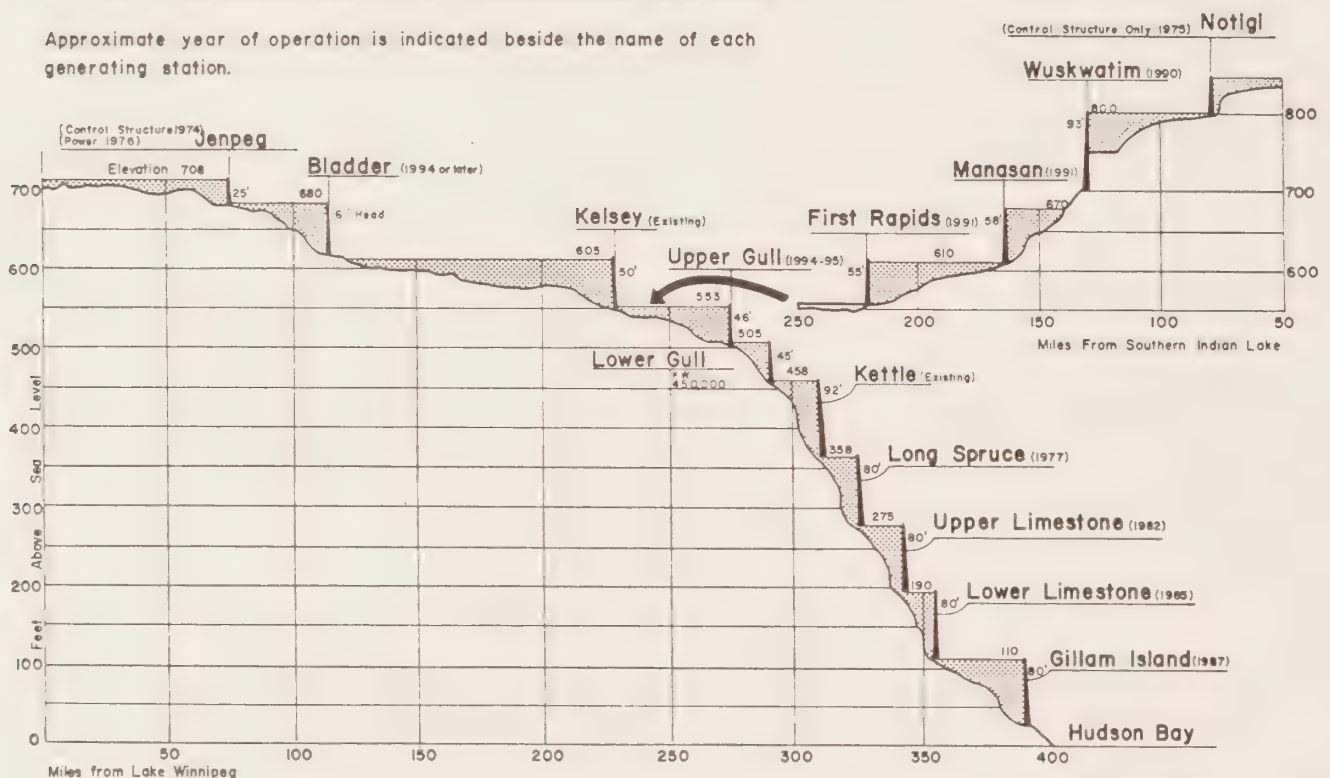
^aIlford fishermen utilize Northern Indian Lake, Fidler and Illiard Lakes.

The Hydro development scheme for northern Manitoba is generally termed the Nelson River Hydroelectric Development Project. This project can be broken into three component parts; harnessing existing Nelson River power, regulating Lake Winnipeg, and diverting the Churchill River into the Nelson. The following is a brief description of each component part of the Nelson River Project (Figure 1).

FIGURE 1.

NELSON AND BURNTWOOD RIVER ULTIMATE PROFILE

Approximate year of operation is indicated beside the name of each generating station.



NELSON RIVER HYDRO-ELECTRIC GENERATING SITES: In addition to the two existing sites (Kelsey and Kettle) and the two sites under construction (Long Spruce and Upper Limestone) there are five hydro-electric generating sites proposed for the Nelson River. These sites are referred to as Lower Limestone, Gillam Island, Upper and Lower Gull and Bladder Rapids. The five proposed sites and two sites under construction have a combined hydro-electric potential of approximately 5 million kilowatts.

LAKE WINNIPEG REGULATION: Lake Winnipeg will be regulated by improving the outlet capacity at the north end of the lake and a control (and generating) facility at Jenpeg. By increasing outlet capacity and regulating lake flow, winter flows in the Nelson River required for power generation can be increased to coincide with peak energy demands. In order for water to be stored and then released for power generation, Lake Winnipeg will be regulated between the levels of 711 and 715 feet above sea level. This regulation will be exercised by a control and generating facility on the West channel and by-pass channels at the north end of the lake. A minor system of dams and dykes has been constructed to increase hydraulic control and prevent flooding.

The structure at Jenpeg will control approximately 75 percent of the Lake Winnipeg outflow (about 73,000 cfs). Jenpeg (using six turbines) will generate 168,000 Kw. with a head of 25 feet. Power production is expected to commence by 1979.

Three channels are associated with Lake Winnipeg regulation in order to increase outflow capacity. They are referred to as 8 Mile Channel, 2 Mile Channel and Ominawin By-Pass.

Kiskitto Lake will be controlled by a series of dams and dykes at the outlets, to Black Duck Creek and the Nelson River West channel. These structures will maintain Kiskitto Lake levels independent of Lake Winnipeg. Regulation will reduce the natural fluctuations of the lake.

CHURCHILL RIVER DIVERSION: Structures associated with the Churchill River Diversion include the Notigi control, the South Bay Diversion channel and the Missi Falls control structure.

Missi Falls control is a grated control structure and spillway located at Missi Falls on the Churchill River. This structure will result in Southern Indian Lake being raised by ten to 13 feet. Maximum drawdown is expected to be two feet. Missi Falls control will result in a reduced flow on the Churchill River of about 75 percent with approximately 27,000 cfs. diverted to the Nelson River. This will result in a two thirds reduction in flow of the Churchill at Hudson Bay.

South Bay diversion channel is an excavation channel connecting South Bay (of Southern Indian Lake) and Issett Lake (upper reaches of the Rat River). This channel is capable of diverting up to 30,000 cfs. from the Churchill to the Nelson.

Notigi control is a structure located on the Rat River at the south end of Notigi Lake to regulate upstream water levels. The control structure is capable of releasing a maximum of 30,000 fcs. to the Burntwood River. Notigi will also be capable of generating 90,000 Kw. of power using a head of 30 to 40 feet. Summer drawdown up to nine feet.

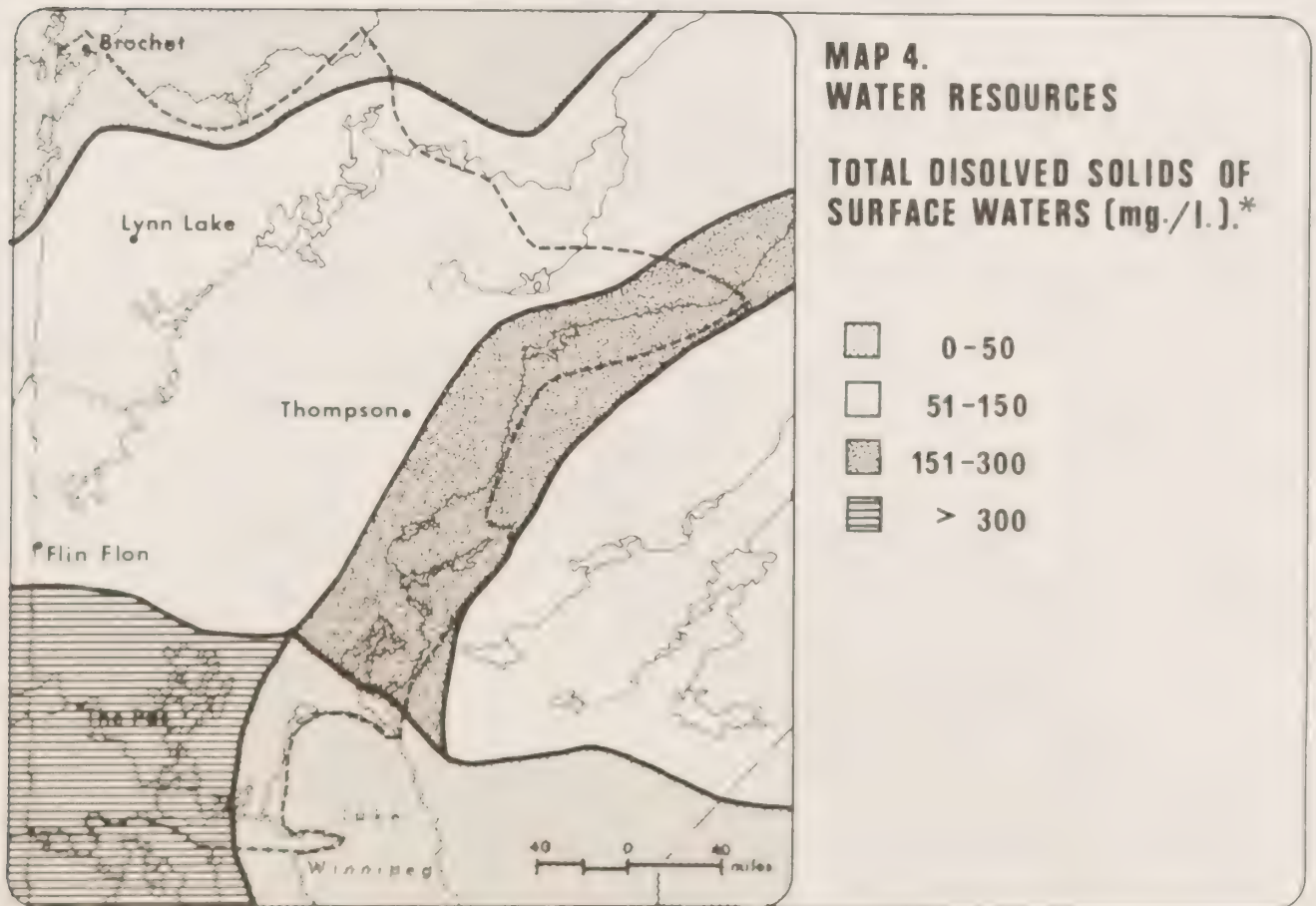
As a result of the Churchill River Diversion, substantial generating stations are feasible on the Burntwood River. Three such structures have been proposed by Manitoba Hydro; Wuskwatim, Manasan and First Rapids stations. These sites would have a combined capacity of about 640,000 Kw.



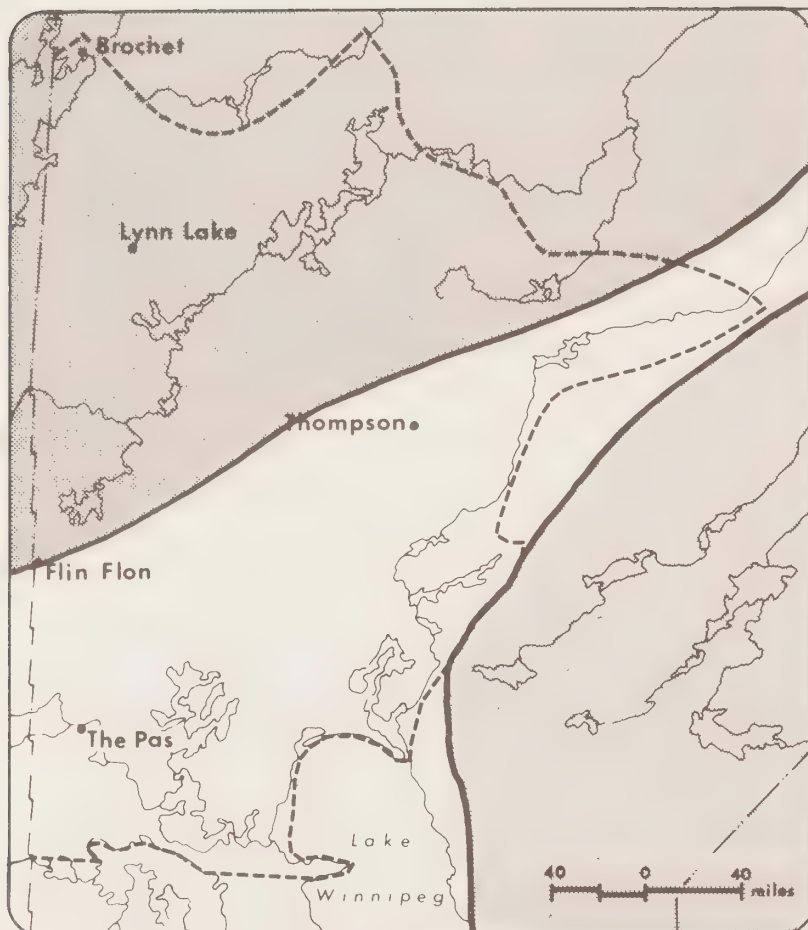
Water Quality

The quality of surface waters in the Zone has not been extensively surveyed. Certain rivers, such as the Saskatchewan and Grass, and certain lakes (Paint, Athapapuskow, etc.) have been surveyed for chemical and biological components. Lake and river surveys done to date have usually been associated with pollution or fisheries studies.

Maps 4-6 present some generalized water data, although the reader is referred to individual studies for specific water composition or quality data. Map 7 displays some of the lakes for which more detailed information is available in report form.



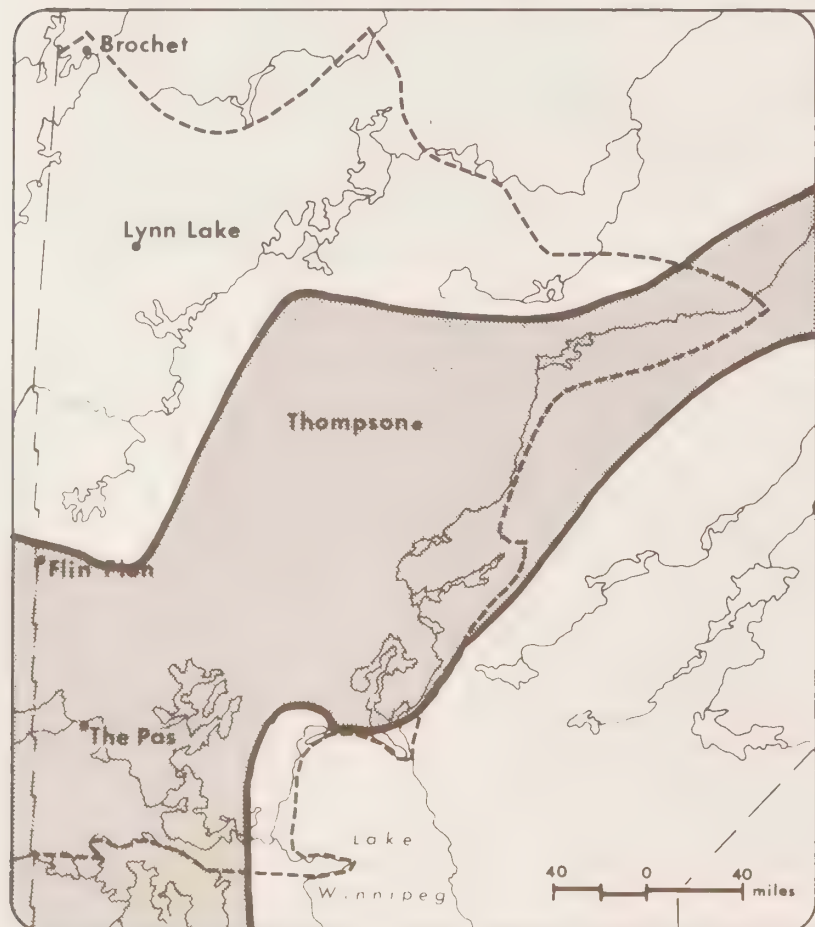
*Source: Fisheries and Environment Canada, 1978



**MAP 5.
WATER RESOURCES**

**HARDNESS OF SURFACE
WATERS (CaCO_3 in mg./l.).***

- 0-60
- 120-180



**MAP 6.
WATER RESOURCES**

**TURBIDITY OF SURFACE WATERS
(JACKSON TURBIDITY UNITS)**

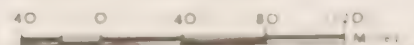
- 0-5.0
- 5.1-10.0



WATER BODIES SURVEYED

MAP 7.
WATER RESOURCES

MID NORTH
PLANNING ZONE



Agriculture

Agriculture is Manitoba's leading industry, grossing an average of 926 million dollars from 1971-1975. This represents an average of 18 percent of the gross provincial product for those years.

Agriculture in the Planning Zone is almost exclusively limited to the area known as the Pasquia land settlement. This area, encompassing 142,720 acres is bordered on the north by the Carrot River, on the south by the Pasquia River and on the west by the Saskatchewan border (Map 1). The Pasquia Valley is in fact a portion of the upper Saskatchewan River Delta. Only about 76,000 of the total is intensively farmed. The breakdown of use of this portion of land is given in Table 1 for 1971. Forty percent of the land was under crops and 20 percent in summerfallow. In 1970, there were 146 land owners in the Pasquia.

Table 1

Land Use of the Pasquia Area 1971

Land Use	Acreage	Percentage
Grain crops	13,560	17.9
Special crops	11,520	15.2
Mixed crops	1,420	1.9
Forage crops	3,840	5.1
Summerfallow	15,160	20.0
Native grasses	12,250	16.2
Scrub grassland	5,320	7.0
Tree grassland	80	0.1
Scrub	5,900	7.8
Open water	250	.3
Woodland	1,950	2.3
Marsh	4,460	5.9
Total	75,710	

Source: PLUP, 1975

The major agricultural limitation in the Pasquia is drainage. A combination of high water table and little gradient results in late spring seeding. With extensive spring rains crops may not be planted. This is perhaps evidenced by the large amount of summerfallow. Late planting results in a later harvest date thereby running the risk of crop loss or harvesting in fall rain and/or snow (a common occurrence in this area). Crops harvested wet must then be dried increasing

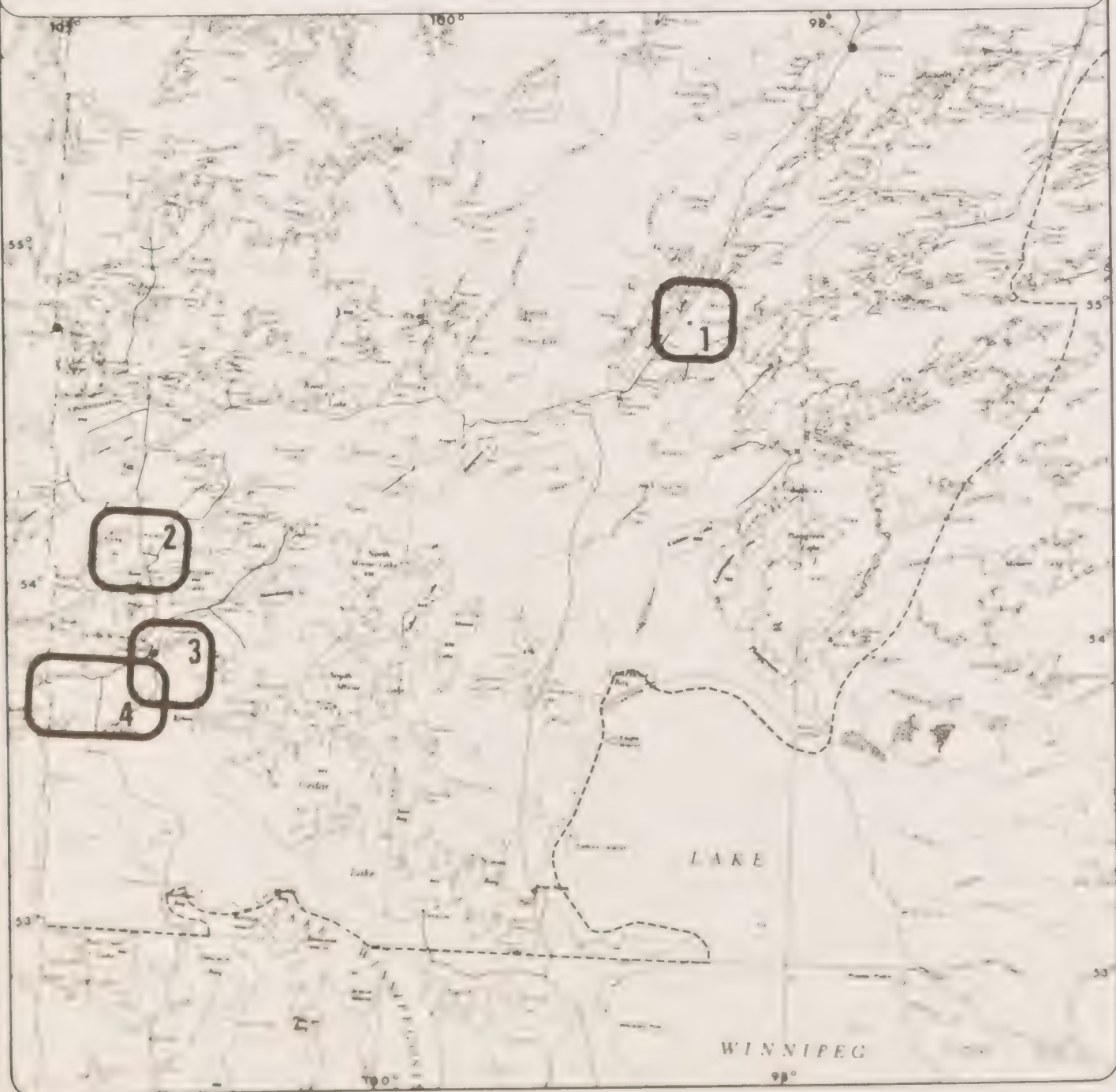
MAP 1.

AGRICULTURE

Mid North Planning Zone

AGRICULTURAL AREAS OF THE PLANNING ZONE

WABOWDEN	1
WANLESS	2
RAHL'S ISLAND	3
PASQUIA	4



production costs. Some farmers have harvested only two or three good crops out of six.¹

Weeds are also a problem in the Valley although less critical than drainage. Poor farm practices and rapid rates of growth combine to result in a weed problem. Fields not worked annually are quickly overtaken by weeds. Fields crops not sprayed with herbicide are frequently weed infested, resulting in costly cleaning operations.

Other problems plaguing Pasquia Valley farmers are: the difficulty of obtaining equipment parts, the lack of a meat processing plant and the availability of off-farm labour.

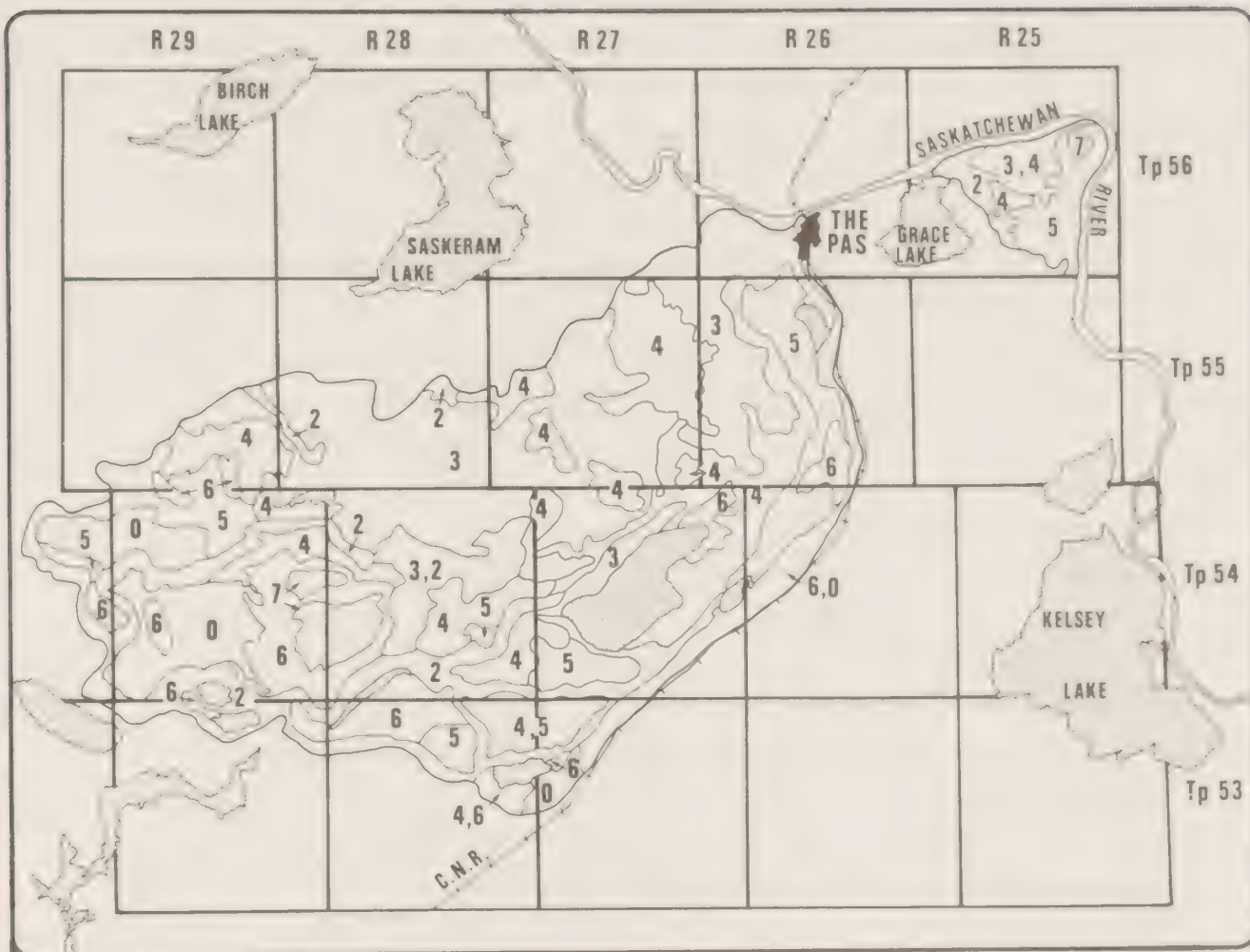
The Agricultural capability (CLI) of the Pasquia is shown on Map 2.

Other agricultural areas in the Zone include the Saskeram Wildlife Management Area (WMA), Rahls Island, Wanless and Wabowden.

The Saskeram is located north of the Carrot River and south of the Saskatchewan River. Its agricultural use is limited to haying and grazing which is done under crown leases. Twenty farmers leased nearly 20,000 acres in this area in 1970. A number of inter-related agricultural problems are encountered in the Saskeram WMA. Access is difficult both for livestock and equipment resulting in no land improvement practices. Some cattle are allowed to free range outside of lease areas resulting in destroyed wildlife habitat, and many leases are overgrazed. Ducks Unlimited holds a lease in the Saskeram in order to manipulate water levels for habitat improvement and waterfowl production. They are restricted in that extensive areas of grazing land would be flooded should they proceed to manipulate water levels within this lease.

Rahls Island, lying immediately east of The Pas is currently utilized primarily for forage production and grazing. The developed area in agricultural production was 6,824 acres in 1971 although adjacent area are used for grazing and cutting native hay.

¹Harper, 1975



AGRICULTURAL CAPABILITY FOR THE PASQUIA AND RAHL'S ISLAND AREAS

MAP 2. AGRICULTURE

Class

2.....

3.....

4.....

Class

5.....

6.....

7.....

0.....

Wanless, 25 miles north of The Pas, was originally an attempt at seed production. The area is well drained and gently undulating. It has been vacant since the late 1950's (it is currently owned by a non-Canadian concern). A market garden/greenhouse operation specializing in bedding plants currently operates at Wanless. The area has a relatively high capability (CLI) for agriculture.

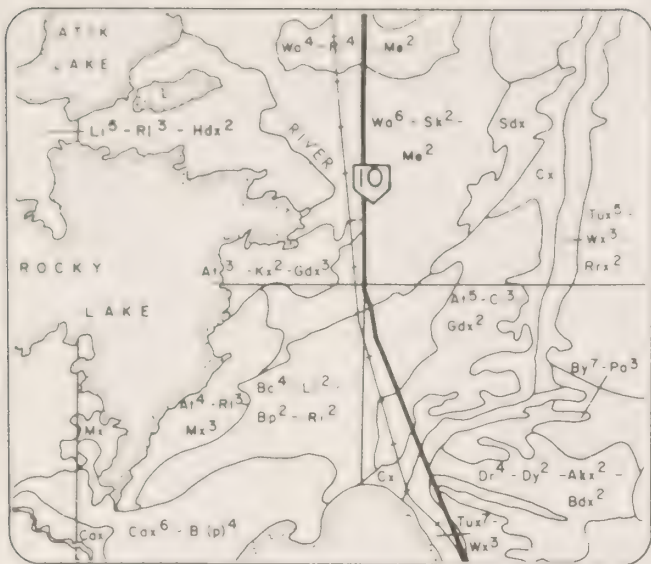
From 1954-1966 (under Order-in-Council 1451-54) a Dominion Agricultural Experimental Substation was operated at Wabowden. Barley, alfalfa, clover, currants, gooseberries, raspberries and a wide variety of vegetables were grown. In 1967, this land was placed under reservation with the Provincial Department of Agriculture under Order-in-Council No. 450/67. In April, 1968 this land was returned to Lands Branch Administration. Some field crop production still takes place on the old substation fields by members of the Wabowden Farmers Association.

Grazing leases on crown land in the Saskeram and Pasquia area amounts to some 28,874 acres.² This acreage is held in 52 leases. There are 68 other agricultural leases and permits in the Pasquia.

Maps 3 and 4 show the soils of the four agricultural areas in the Planning Zone.

Extensive Agriculture is severely limited in the Mid North Planning Zone. Climate, drainage and lack of mineral soils are the major limiting factors to the expansion. Local intensive farming of a specialized and specific crop nature may be able to overcome any one or all of the generally limiting parameters.

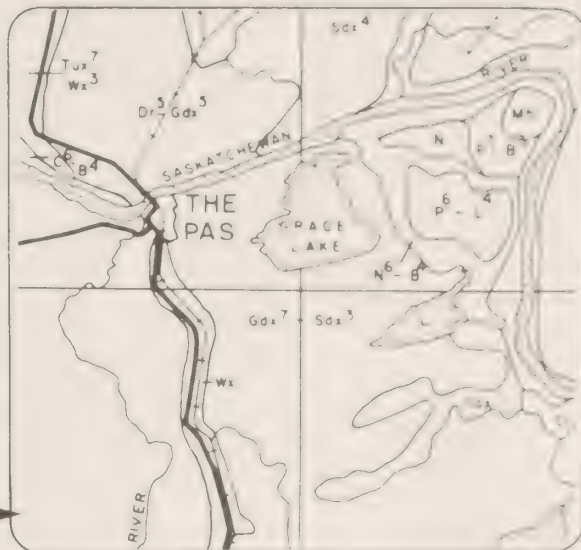
²Agricultural Crown Lands December, 1977



▲ WANLESS
 ▲ RAHL'S ISLAND
 ▼ PASQUIA

**SOILS OF MID NORTH
 AGRICULTURAL ZONES
 FOR LEGEND SEE PAGE**

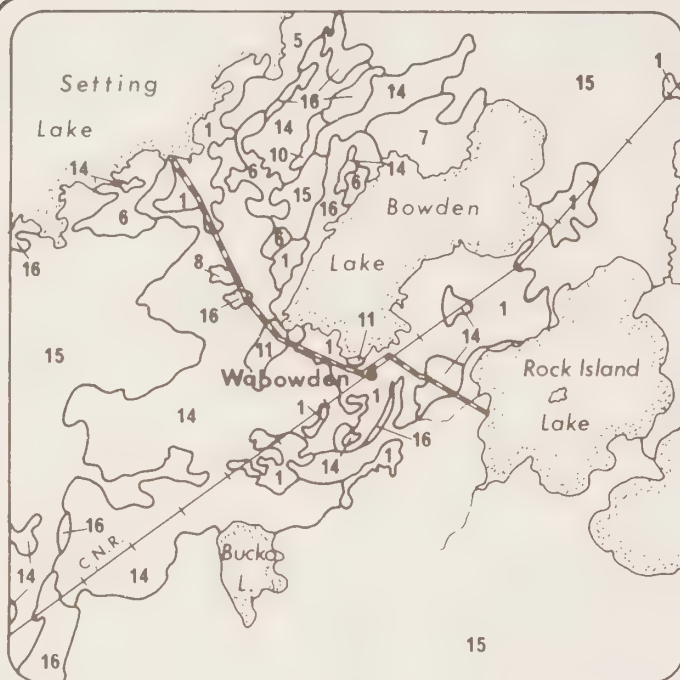
**MAP 3.
 AGRICULTURE**



Map 3 Legend

Parent Material	Map Symbol	Natural Drainage	Soil Name and Dominant Texture	Subgroup Profile	Dominant Vegetation	Topography	Stoniness
Extremely calcareous medium textured till	At	Well	Atikameg Series (loam)	Degraded Eutric Brunisol	Black spruce, jackpine, aspen	Very gently undulating	Very stony to excessively stony
	Wy		Westray Series (loam)	Orthic Grey Luvisol	Black spruce, jackpine, aspen	Very gently undulating	Very stony to excessively stony
	Dr	Poor	Dering Series peaty phase (loam)	Rego Gleysol	Black spruce, Ledum sp., Feather and Sphagnum mosses	Depressional to level	Moderately stony to very stony
20 to 40 inches of extremely calcerous medium textured till over limestone bedrock	Li	Well	Limestone Point Series (loam)	Degraded Eutric Brunisol	Black spruce, jackpine, aspen	Very gently undulating	Very stony to excessively stony
	Bc	Imperfect	Birch Bay Series (loam)	Gleyed Degraded Eutric Brunisol	Black spruce, aspen, willow	Very gently undulating	Moderately stony to exceedingly stony
	Bp	Poor	Biscuit Point Series, peaty phase (loam)	Rego Gleysol	Black spruce, Ledum sp., Feather and Sphagnum mosses	Depressional to level	Moderately stony to very stony
Moderately to strongly calcareous fine textured till	Cl	Well	Cedar Lake Series (clay)	Orthic Grey Luvisol	Black spruce, jackpine, aspen	Very gently undulating	Moderately stony
	Dy	Imperfect	Dyce Series (clay)	Gleyed Grey Luvisol	Black spruce and white spruce	Very gently sloping	Slightly to moderately stony
Moderately to strongly calcareous lacustrine clay	Wa	Well	Wabowden Series (clay)	Solodic Grey Luvisol	Black & white spruce, aspen and jackpine	Undulating	Stone-free
	Sk		Sipiwesk Series (clay)	Orthic Grey Luvisol	Black & white spruce, aspen and jackpine	Undulating	Stone-free
	Rl	Imperfect	Roe Lake Series	Gleyed Grey Luvisol	Black & white spruce and aspen	Gently undulating	Stone-free
	Me		Medard Series, peaty phase (clay)	Rego Gleysol	Black spruce, Ledum sp., Feather and Sphagnum mosses	Gently undulating to near level	Stone-free
Non-calcareous glacio-fluvial sand deposits	Pa	Imperfect	Pakwa Series (medium to fine sand)	Gleyed Degraded Dystric Brunisol	Jackpine and black spruce	Undulating	Stone-free
	By	Poor	Baldy Series peaty phase (medium to fine sand)	Rego Gleysol	Black spruce, Feather and Sphagnum mosses	Near level	Stone-free
Stratified calcareous sand and gravel outwash and beach deposits	Wx	Rapid to well	Woodridge Complex (sand and gravel)	Orthic Grey Luvisol Orthic Eutric Brunisol Degraded Eutric Brunisol	Jackpine, black spruce	Gently undulating to undulating (low narrow ridges)	Slightly to moderately stony
	Tux	Imperfect	Tremaudan Complex (sand and gravel)	Gleyed Grey Luvisol Gleyed Degraded Eutric Brunisol	Black spruce, jackpine and aspen	Gently undulating	Slightly to very stony
Weakly to moderately calcareous medium to moderately coarse textured recent alluvial deposits	N	Imperfect	Nels Series (fine sandy loam to loam)	Gleyed Cumulic Regosol	Balsam poplar, aspen, white spruce, some elm, maple & ash, willow	Very gently to gently undulating	Stone-free
	P	Poor	Pasquia Series (very fine sand to silt loam)	Carbonated Rego Gleysol	Sedges, reeds, willows & some aspen	Depressional to nearly level	Stone-free
Weakly to moderately calcareous moderately fine to medium textured recent alluvial deposits	C	Imperfect	Carrot Series (fine sandy loam to loam)	Gleyed Cumulic Regosol	Balsam poplar, aspen, white spruce, some elm, maple & ash, willow	Very gently to gently undulating	Stone-free
	B	Poor	Big Lake Series (fine sandy clay loam to clay loam)	Carbonated Rego Gleysol	Sedges, reeds, willows & some aspen	Depressional to nearly level	Stone-free

Parent Material	Map Symbol	Natural Drainage	Soil Name and Dominant Texture	Subgroup Profile	Dominant Vegetation	Topography	Stoniness
Weakly to moderately calcareous fine textured recent alluvial deposits	L	Poor	Le Pas Series (silty clay to clay)	Carbonated Rego Gleysol	Sedges, reeds, willows and some aspen	Depressional to nearly level	Stone-free
Thin muck and silty deposits over calcareous sediments	Mh	Very poor	Marsh Complex (mucky silty clay)	Rego Gleysol	Rushes, reeds and sedges	Depressional to level	Stone-free to moderately stony
0 to 4 inches or rubble over limestone bedrock	R	Rapid	Rock outcrop		Some jackpine & black spruce	Irregular steeply sloping	
16 to 52 inches of mesic forest peat or thin (0 to 24 inches) of fibric Sphagnum moss peat overlying mesic forest peat	Cdx		Grindstone Complex (underlain by extremely calcareous till)				
	Rrx		Rat River Complex (underlain by calcareous sand)				
	Akx	Poor to very poor	Atik Complex (underlain by medium to fine textured calcareous lacustrine sediments)	Terric Fibric Mesisol Terric Mesic Fibrisol Terric Mesisol Terric Fibrisol	Black spruce with an understory of feather and Sphagnum mosses & ericaceous shrubs	Level to depressional	Stone-free
24 to 64 inches of fibric Sphagnum moss peat which may be underlain by significant amounts of forest or sedge peat	Mx	Poor to very poor	Molson Complex (underlain by medium to fine textured calcareous lacustrine sediments)	Terric Mesic Fibrisol Terric Fibric Mesisol Terric Fibrisol	Stunted black spruce & tamarack with an understory of Sphagnum mosses and ericaceous shrubs	Depressional to level	Stone-free
	Kx	Kilkenny	Kilkenny Complex (underlain by extremely calcareous till)				
12 to 52 inches of moderately decomposed sedge peat with little (6 inches) or no Sphagnum moss peat deposits	Cax	Very poor	Cayer Complex (underlain by medium to fine textured calcareous lacustrine sediments)	Terric Mesisol Terric Fibric Mesisol	Sedges & mosses with clumps of black spruce & tamarack	Depressional to level	Stone-free
	Cx		Crane Complex (underlain by extremely calcareous till)				
Mesic forest peat greater than 52 inches thick or thin (0 to 24 inches) fibric Sphagnum moss peat overlying mesic forest peat			Bradbury Complex (underlain by extremely calcareous till)	Typic Mesisol Mesic Fibrisol	Black spruce with an understory of feather and Sphagnum mosses & ericaceous	Depressional to level	Stone-free
			Hargrave Complex (underlain by medium to fine textured calcareous lacustrine sediments)				
Greater than 52 inches of mesic sedge peat with little (6 in.) or no Sphagnum moss peat deposits	Sdx	Very poor	Stead Complex (underlain by medium to fine textured calcareous lacustrine sediments)	Typic Mesisol	Sedges & mosses	Depressional to level	Stone-free



MAP 4. AGRICULTURE

SOILS OF THE WABOWDEN AGRICULTURAL AREA

SOILS OF THE UPPER NELSON RIVER BASIN AREA

Map Symbol	Soils	Land Pattern
1	Wabowden Half Bog and others	80-100% 0-20% Irregular, gently to moderately sloping with some peaty depressions.
6	Wabowden Rockland and others	40-60% 40-60% Irregular, gently to steeply sloping with about 50 percent of Rockland.
8	Sipiwesk Wabowden and others	80-100% 0-20% Irregular, gently to moderately sloping with a few small peaty areas.
10	Pipun Wabowden and others	80-100% 0-20% Irregular, very gently to gently sloping with some peaty areas.
11	Minago Wabowden and others	40-60% 40-60% Irregular, very gently to gently sloping with some peaty areas.
14	Half Bog Others	80-100% 0-20% Level to very gently sloping with a few low knolls.
15	Bog Others	80-100% 0-20% Generally level with a few low knolls.
16	Rockland Others	80-100% 0-20% Mainly low hills of granitoid rock outcrops.

SOIL COMPLEXES

Soil	Soil Sub-Group	Natural Drainage	Surface Deposits
Wabowden series	Solonchets Grey Wooded	Moderately well drained	Lacustrine clay
Sipiwesk series	Orthic Grey Wooded	Moderately well drained	Lacustrine clay
Pipun series	Orthic Grey Wooded	Moderately well drained	Thin lacustrine clay on lacustrine silt
Minago series	Orthic Grey Wooded	Moderately well drained	Lacustrine silt
Half Bog		Very poorly drained	12-30 inches of peat generally underlain with clay
Bog		Very poorly drained	>30 inches of peat
Rockland			Deposits over bedrock are thin to absent



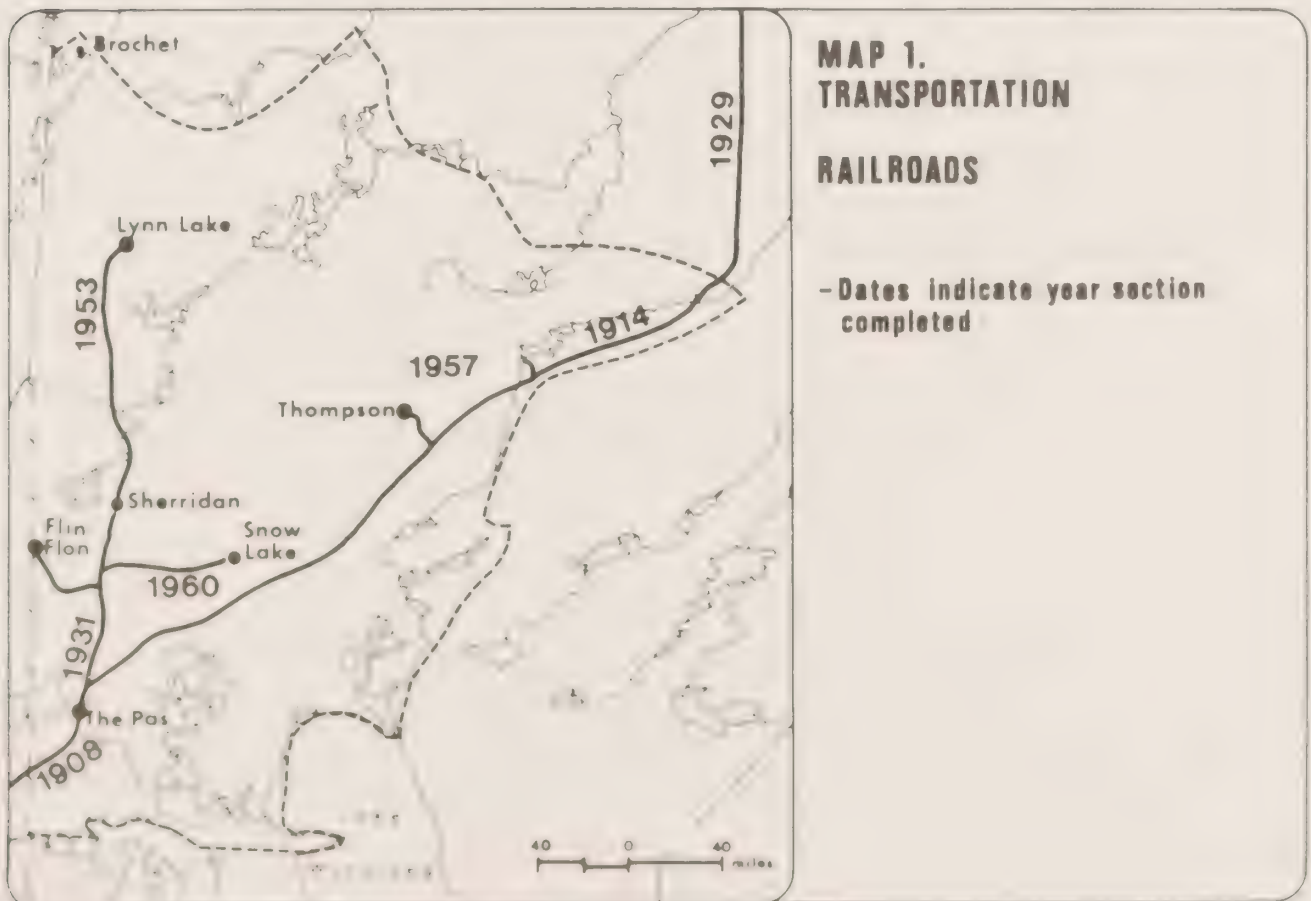
Land Use

Transportation

Historically, the rivers of the north were the highways, cross country travel in summer was generally impractical for long distances. This dependance on the river systems led to the formation of many northern communities (e.g., Norway House, The Pas). Today, the Planning Zone is serviced by Air, Rail and Road networks as well as the tradition water routes.

Rail Transportation

In 1908 the first rail intrusion into the Zone was completed linking The Pas with Hudson Bay Junction (Saskatchewan). By 1929 the line was extended to Churchill with dozens of service points established on the line, some of which have become sizeable communities (e.g., Wabowden, Pikwitonei, Thicket Portage). The railroad was extended to Sherridon in 1931 and to Lynn Lake in 1953. Additional spur lines were built into Thompson (1957) and Chisel Lake (1960) (Map 1).



The Canadian National (CNR) now hauls food supplies, wood, ore and passengers to and from a majority of the zone communities. The railway has made mining in northern Manitoba economically viable, encouraged the expansion of forest operations and permitted the construction of Hydroelectric dams.

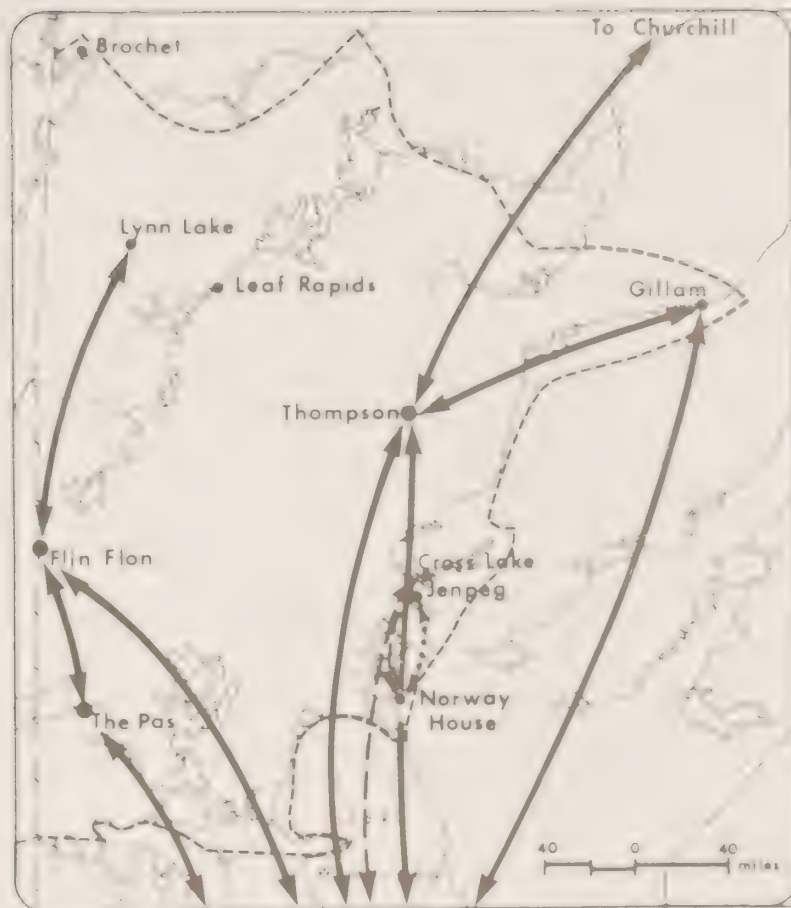
Air Transportation

The largest air carrier in the Mid North is Transair Ltd. flying scheduled air service to six communities (Map 2) and linking the Zone with Churchill and Winnipeg. Other scheduled service is provided by Calm Air, Perimeter Aviation and Aero Trades. In addition to the scheduled air network, a number of companies are available for charter and lease. Table 1 provides a list of charter firms located in the Planning Zone.

The Manitoba Government air division maintains two permanent air facilities in the north, one at Grace Lake near The Pas and one at Thompson. Both Thompson and The Pas facilities include wheel, float and ski equipped aircraft. In addition, aircraft are also stationed at other points in northern Manitoba during the forest fire season for detection, water bombing and fire crew transportation.

A large number of air facilities are available, ranging from sheltered enclaves for float planes to multi-runwayed airports such as Clearwater Lake. Air facilities as shown in the Ministry of Transport flight guide are found on Map 3.

Thompson is the major destination and origin of air travelers, with The Pas and Gillam both fairly high in passenger traffic (Table 2).



MAP 2. TRANSPORTATION

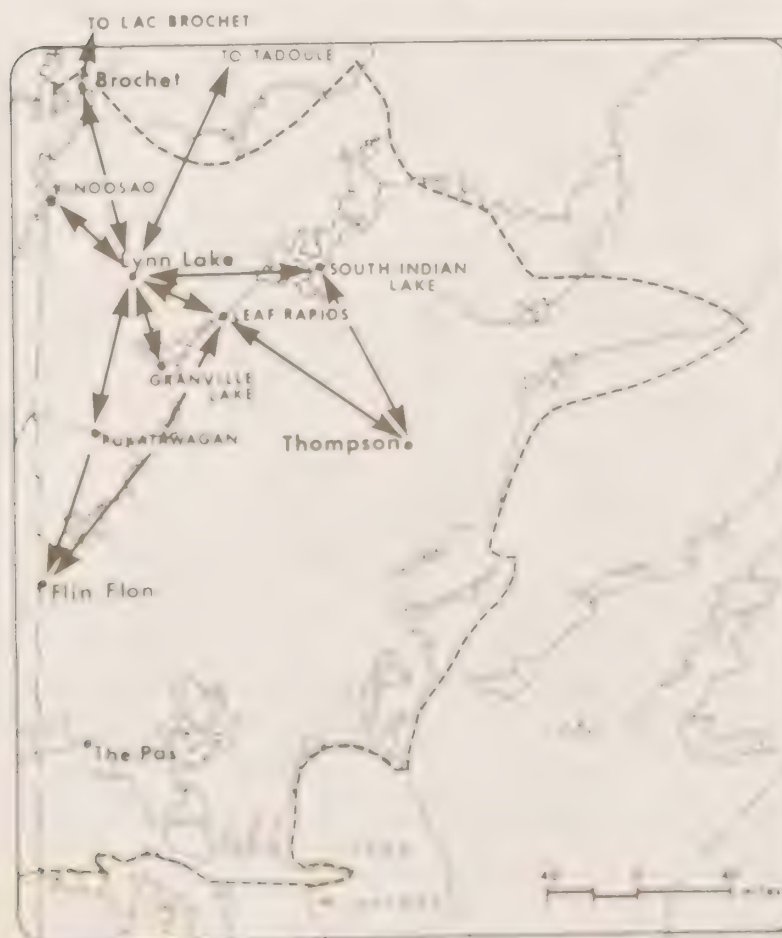
SCHEDULED AIR ROUTES*

TRANSAIR

PERIMETER

AERO TRADES

* (May, 1978)



MAP 2a TRANSPORTATION

SCHEDULED AIR ROUTES*

CALM AIR

* (Oct. 29, 1978)

Table 1

Air Craft Charter Companies Located in The Mid North^a

Company	Location
Aero Trades	Norway House, Jenpeg
Calm Air	Lynn Lake, Leaf Rapids, Thompson
Cross Lake Air Service	Wabowden
Ellair Ltd. (Ilford-Riverton)	Thompson
Fly-A-Long Ltd.	Norway House
Keewatin Air Ltd.	Ilford, Gillam
Kississing Air	Lynn Lake
Laronge Aviation	Lynn Lake
Lambair	The Pas, Gillam, Thompson
Midwest Helicopters	Thompson
Parson Airways	Flin Flon
Transair-Midwest	Flin -lon, Gillam, Lynn Lake, Norway House, The Pas, Thompson
Custom Helicopters	Thompson

^a November, 1978

Table 2

Estimated Domestic Air Passenger Statistics
Mid North Airports

Community	1974		1975		1976	
	Out Bound	In Bound	Out Bound	In Bound	Out Bound	In Bound
Cross Lake	30	370	260	440	210	490
Flin Flon	8,640	9,130	7,020	7,160	7,640	7,730
Gillam	10,730	10,600	11,540	10,910	10,640	10,420
Leaf Rapids	1,230	2,510	800	1,750	560	870
Lynn Lake	11,730	11,590	7,630	7,930	5,280	5,480
Missi Falls	150	530	320	610	100	240
Norway House	3,930	3,900	3,590	3,920	3,790	3,960
The Pas	11,650	11,550	11,380	11,400	12,340	11,720
Thompson	27,090	27,410	26,060	25,960	25,440	25,660
Wabowden	-	10	10	10	-	-

Source: Manitoba Statistical Review, 1st quarter, 1978



TRANSPORTATION - AIR FACILITIES

GOVERNMENT OF MANITOBA: LAND ▲ WATER △

SHELTERED ANCHORAGE ■

PRIVATE □

MAP 3.

TRANSPORTATION

MID NORTH
PLANNING ZONE

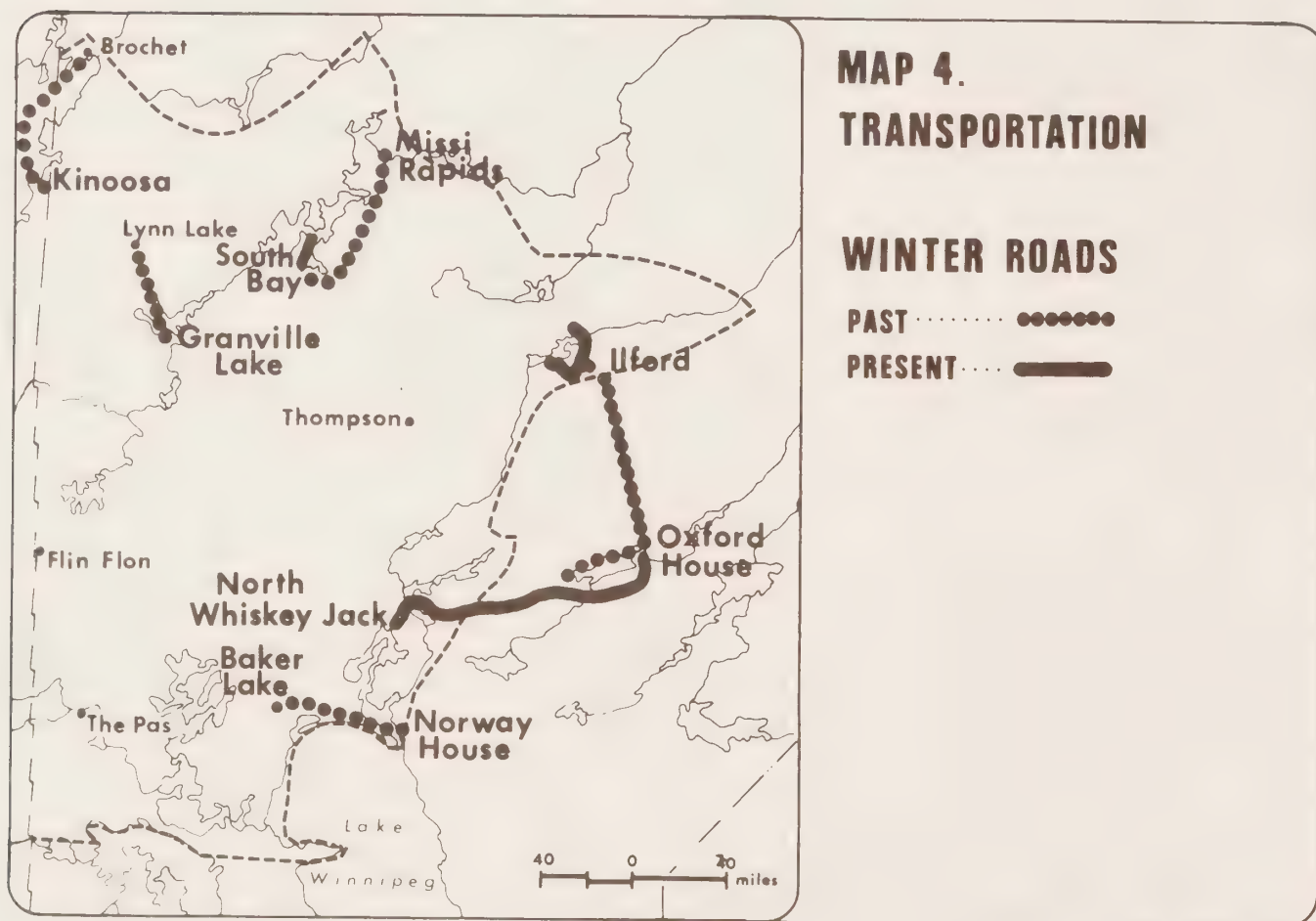
January 1974.

1 inch = 40 miles

Winter Roads

The early 1930's marked the appearance of the first winter roads in the Mid North linking Ilford to Gods Lake and Wabowden to Cross Lake. Whereas horse drawn sleighs were initially used, modern tractor trailers are now in service.

Winter roads are still in use to some communities (Map 4) for hauling food, fuel and other dry goods, however, with the expansion of all weather roads there use is diminishing.



Water Transportation

This traditional transportation mode upon which all commerce depended in the past, is still in use in some areas of the planning zone. Fish are hauled by boat from Granville and Southern Indian Lakes to Leaf Rapids. Large bulk goods are hauled by barge to Norway House on Lake Winnipeg and pulp wood has been hauled from Warrens Landing to the Abitibi mill at Pine Falls. Barges are in operation on some lakes and rivers in the zone (e.g., Saskatchewan River and Reindeer Lake) and ferries are in use (or will be) at Sea River Falls, Cross Lake and Split Lake.

All Weather Roads

The all weather road system have been the most rapidly expanding transportation mode in the north in recent years. Hundreds of miles of road have been built in the last 20 years and have changed the face of northern Manitoba.

The major all weather roads are shown on Map 5 with the approximate average daily traffic flow.

Maintenance of provincial roads in the north was over a million dollars in 1976/77. This averaged out at 1637 dollars per mile (Table 3).



TRAFFIC FLOWS 1978

Vehicles/Day



Provincial Road



Provincial Highway



MAP 5.

TRANSPORTATION

MID NORTH
PLANNING ZONE

Table 3

MAINTENANCE OF PROVINCIAL ROADS
IN THE MID NORTH 1976/77

<u>Road</u>	<u>Miles</u>	<u>Summer Expenditure</u>	<u>Winter Expenditure</u>	<u>Total Expenditure</u>	<u>Cost Per Mile</u>
282	14.8	22,139.92	2,742.32	24,882.24	1,681.23
283	24.7	31,258.95	6,742.45	38,001.40	1,538.52
285	9.5	28,517.43	11,771.22	40,288.65	4,240.91
287	11.8	27,590.19	5,983.49	33,573.68	2,845.23
289	2.4	4,124.51	1,697.50	5,822.01	2,425.84
291	2.8	2,837.14	3,928.17	6,765.31	2,416.18
373	19.4	111.10	268.12	379.22	19.55
375	3.7	2,879.07	490.23	3,369.30	910.62
391	398.3	500,094.38	258,164.38	759,258.76	1,903.74
392	26.6	8,252.00	23,078.74	31,330.74	1,177.85
393	11.8	8,669.48	2,330.67	11,000.15	932.22
394	62.7	10,681.96	4,124.51	14,806.47	236.15
395	8.1	11,365.96	2,340.58	13,706.54	1,692.17
396	28.2	9,493.09	19,206.02	28,699.11	1,017.70
397	3.4	5,402.64	11,338.61	16,741.25	4,923.90
398	1.1	962.01	534.03	1,496.04	1,360.04
399	0.3	252.60	1,521.52	1,774.12	5,913.73
TOTAL	629.6	674,632.43	356,262.56	1,030,894.99	
MEAN					1,637.38

SOURCE: 1976-77 Annual Report of the Department of Highways

Communities

There are 28 communities within the Mid North Planning Zone ranging in size from 59 (Granville Lake) to over 21,000 (Thompson) people (Map 1). Their level of infrastructure development, range of services and economic bases vary as widely as their size. Most communities in the zone originated in association with fur trade posts or more recently with mineral operations.





COMMUNITY LOCATION

POPULATION	59 - 599
	600 - 1499
	1500 - 2999
	3000 - 10000
	>20000



MAP 1.

COMMUNITIES

MID NORTH
PLANNING ZONE

1 inch = 40 miles

Demographic Characteristics

The population of the zone is estimated at 67,453 people, an increase of 18.8 percent since 1971 (Table 1). The provincial increase for the same period has been 4.4 percent. The total population of the Zone's communities represents about six percent of Manitoba's population.

There are three types of populations into which the communities may be divided. The 'traditional' settlements are characterized by very young populations (over 40 percent under 15 years). Many of the Indian reserves in the Mid North are examples of this type of community (Figure 1). The second type of settlement are the 'Resource' communities which are characterized by a high percentage of work-age males.¹ The mining and hydro towns are good examples of 'Resource' communities. The final settlement type merely includes all other communities.

Vital statistics on a community basis are only available for Flin Flon, The Pas and Thompson (Table 2). Although actual data is not readily available for the majority of communities, these three cities represent 58 percent of the Zone's population.

The population dynamics of the northern Manitoba communities differ from those of the south and in fact there are wide variations between northern centers. The population of the zone has been growing at an annual rate of 2.4 percent since 1971. Five communities (Flin Flon, Lynn Lake, Wabowden, Thicket Portage and Pikwitonei) have displayed annual decreases in population ranging from 0.2 percent (Flin Flon) to 5.2 percent (Thicket Portage). Six communities are increasing at rates between 0.1 percent and two percent (Thompson, Gillam, Norway House, Cranberry Portage, Grand Rapids and Cormorant).² There are eight communities increasing in population at rates between two and four percent annually (Snow Lake, Moose Lake, Brochet, Pukatawagan, Easterville, South Indian Lake, Ilford and Sherridon).³ The remaining eight communities

¹ In the Zone's mining communities, males outnumber females by 30 percent in the 15-34 age groups. Males in these groups represent 26 percent of the mining communities populations.

² Two percent annual increase results in doubling population in 35 years

³ A four percent annual increase results in population doubling every 18 years

Table 1
Community Population Profile

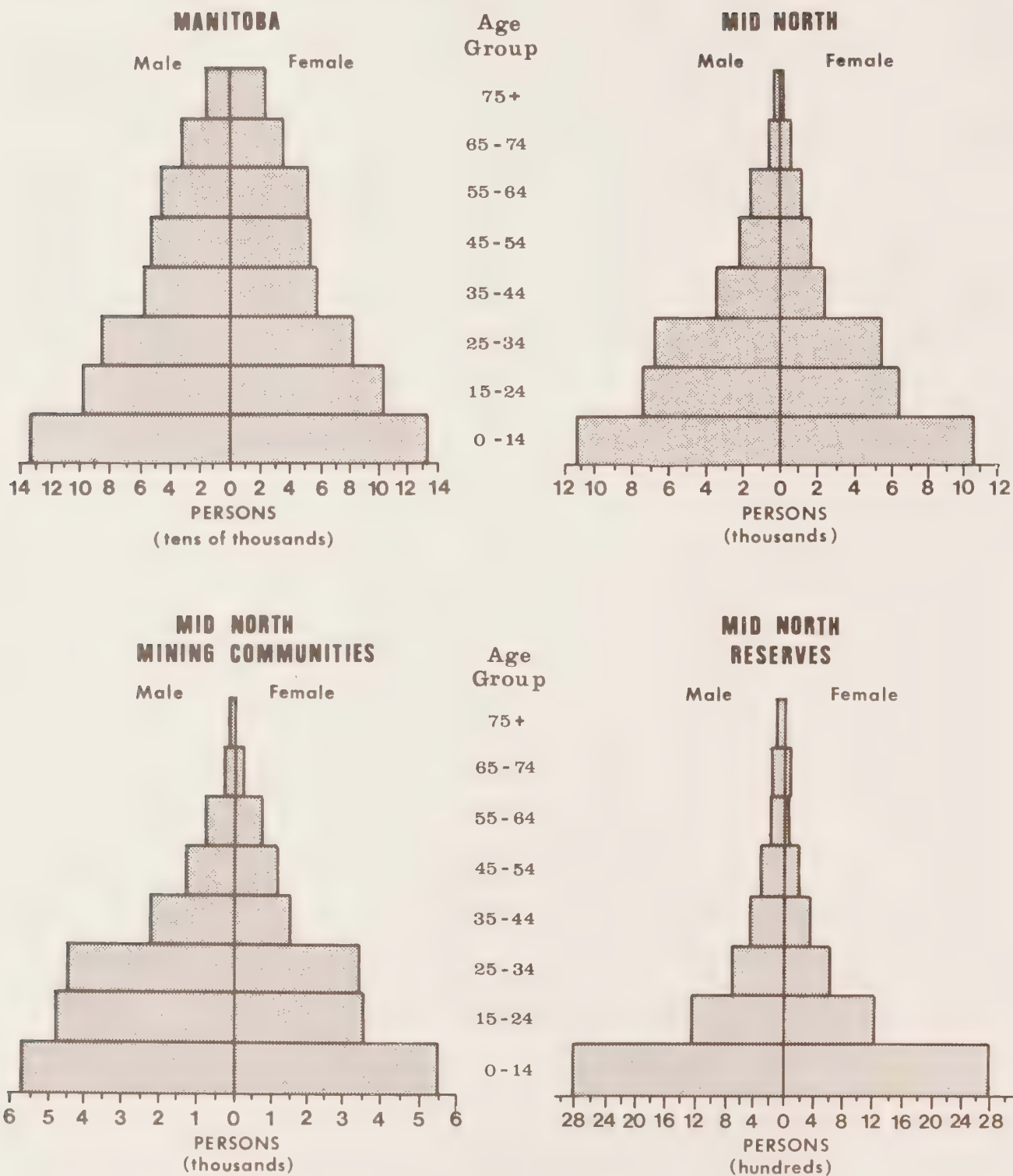
Community	Population				% Change		
	61	66	71	78	61-71	61-78	71-78
Thompson	3,449	8,989	19,005	21,034	451.0	509.8	10.6
The Pas	4,671	5,031	6,062	9,516	29.7	103.7	56.9
Flin Flon	10,546	9,674	8,873	8,776	- 15.8	-16.7	- 1.1
Lynn Lake	2,118	2,189	3,515	2,748	65.9	29.7	- 21.8
Gillam LGD	332	356	1,921	2,187	478.6	558.7	13.8
Norway House	543	2,275	2,762	3,056	408.6	462.7	10.6
Leaf Rapids	n.a	n.a	25	2,368	N/A	N/A	9372.0
Snow Lake	915	1,408	1,582	1,989	78.8	117.3	25.7
Cross Lake	1,051	n.a	1,917	2,543	82.3	141.9	32.6
Nelson House	n.a	847	1,504	1,989	N/A	N/A	32.2
The Pas Reserve	792	927	768	1,211	- 3.0	52.9	57.6
Cranberry Portage	907	618	922	1,021	1.6	12.5	10.7
Wabowden	327	594	1,051	763	221.4	133.3	- 27.4
Split Lake	328	384	799	1,161	143.5	253.9	45.3
Moose Lake	283	638	750	909	165.0	221.2	21.2
Brochet	n.a	n.a	822	960	N/A	N/A	16.7
Pukatawagan	n.a	699	967	1,171	N/A	N/A	21.0
Easterville	n.a	399	506	603	N/A	N/A	19.1
South Indian Lake	103	477	615	784	49.7	661.1	27.4
Grand Rapids LGD	986	571	660	670	- 33.0	-32.0	1.5
Cormorant	272	342	396	436	45.5	60.2	10.1
Thicket Portage	275	282	360	229	30.9	-	- 36.3
Pikwitonei	175	230	258	200	47.4	14.2	- 22.4
Ilford	165	n.a	187	217	-	31.5	16.0
York Landing	16	65	199	395	1143.	2368.7	98.0
Sherridon	220	233	166	196	- 24.5	-10.9	18.0
Wanless	156	102	123	202	- 21.1	29.4	64.2
Granville	n.a	99	74	119	N/A	N/A	60.8
<hr/>							
TOTAL	28,630	37,429	56,789	67,453	98.3	135.6	18.8

Source: Northern Affairs
Manitoba Health Services Commission, Computer Printout

n.a. data not available

N/A not applicable

FIGURE 1. POPULATION PYRAMIDS.¹



¹ June 1978, Manitoba Health Services.

in the zone have for the past eight years (1971-1978) been experiencing annual population increases in excess of four percent. These range from 4.6 percent for Nelson House to 14.1 percent for York landing.⁴

Should the 2.7 percent rate of increase continue, the population of the planning zone will be over 120 thousand by the year 2000.

The male population of the Mid North exceeds the female portion of the population by over seven percent. In the 'resource' communities nearly 55 percent of the population are male.⁵ In 'traditional' communities males account for nearly 52 percent of the population. Population (1978) data indicates that only in Grand Rapids, Moose Lake and Easterville the female portion of the population exceed the male portion.

The age structure of the planning zone is heavily biased toward young people as can be seen by the age/sex pyramid. Thirty-four percent of the population is under 15 years old and 56 percent are under 25 years.⁶

In summary, the population of the Mid North Planning Zone is younger, has a higher proportion of males⁷ and is more rapidly increasing⁸ than the total Manitoba population.

⁴ Leaf Rapids excluded

⁵ Snow Lake, Lynn Lake, Leaf Rapids, Flin Flon and Thompson

⁶ This compares to 25 percent and 44 percent respectively for Manitoba

⁷ Manitoba: 49.9 percent male, 50.1 female

⁸ Manitoba increasing at 1.5 percent per year for period 1971-1978

TABLE 2

Vital Statistics of Selected Mid North Communities

	Births				Deaths		Marriages	
	1974	1975	1974	1975	1974	1975	1974	1975
	Males		Females					
Flin Flon	40	52	21	22	71	71	29	28
The Pas	95	85	107	71	44	54	24	17
Thompson	324	280	300	299	80	88	100	100

Source: Manitoba Statistical Review, 3rd quarter, 1977
4th quarter, 1976

Economy

Over the last two decades there have been many changes in northern Manitoba resulting from increased contact with the industrialized southern society. Discovery and development of natural resources has facilitated an increase in availability of wage employment to many northern residents. Educational levels of the native peoples (especially the younger generation) have been increasing and many are now taking an active role in community affairs.

The potential labour force of the Planning Zone in 1978 was approximately 75 percent of the total population or 42,336 (Table 3). This number was calculated considering all individuals in the population between the ages of 14 and 64 years as being eligible to work. The estimated actual labour force of the Zone is calculated by applying the provincial participation rate for 1978 to the potential labour force. The resultant figure (26,080) indicates the approximate number of people who are either employed or actively seeking work.

There are a number of factors affecting the rate of employment or unemployment within the Planning Zone. Location of the job is a critical factor since many potential workers prefer not to relocate.⁹ Season of employment may also determine the availability of local persons to work as in some communities, traditional activities such as hunting and fishing take priority over occasional wage employment. The benefits derived from traditional activities (income-in-kind) may exceed those offered by sporadic wage employment. Educational and/or technical qualifications of local residents may not meet standards required to fill specific vacancies. Professional, technical and administrative personnel are usually imported from southern Manitoba to work on northern projects.

Three distinct community economies exist in the Mid North Planning Zone: traditional, wage and the transfer payment economy. The traditional communities have depended upon the extensive use of land and water resources for their economic livelihood for many decades. Particular locations were settled because of the abundance of fish and wildlife resources or for their proximity to early trading posts. Working family groups were characteristic of this economy. In many remote

⁹Department of M.R.E.M. Nelson House Community Profile 1974

Table 3

Mid North Labour Force

Community	Population*	Potential Labour Force ^a	Estimated Actual Labour Force ^b
Thompson	21,034	14,341	8,834
The Pas	9,516	6,273	3,864
Flin Flon	8,776	6,105	3,761
Lynn Lake	2,748	1,851	1,140
Gillam	2,187	1,508	929
Norway House	2,391	1,287	793
Leaf Rapids	2,368	1,549	954
Snow Lake	1,989	1,438	886
Cross Lake	2,087	1,108	683
Nelson House	1,871	899	554
The Pas Reserve	1,211	648	399
Cranberry Portage ¹	1,099	660	407
Wabowden ¹	1,019	555	342
Split Lake	1,161	602	371
Moose Lake ¹	809	513	316
Brochet ¹	745	337	208
Pukatawagan	1,171	559	344
Easterville ¹	687	300	185
South Indian ¹	697	302	186
Grand Rapids	670	424	261
Cormorant ¹	551	252	155
Thicket Portage ¹	350	165	102
Pikwitonei ¹	295	140	86
Ilford ¹	266	141	87
York Landing	395	205	126
Sherridon ¹	165	79	49
Wanless ¹	123	64	39
Granville ¹	59	31	19
TOTAL	66,440	42,336	26,080

*1978 Manitoba Health Services (MHSC) population figures

¹1975 MHSC population figures

^aAll individuals 14-64 years

^bManitoba Bureau of Statistics 1977 average participation rate is 61.6% of potential labour force

northern communities traditional activities (trapping, hunting and fishing) are pursued as they contribute income-in-kind to the communities (Table 4). In communities such as Pukatawagan, income-in-kind derived from traditional activities contributed 14.8 percent of the community income (1975).

Table 4
Percentage of Community Income
Derived from Traditional Activities

	Cash	Trapping Income-in-kind	Cash	Fishing Income-in-kind
Brochet ^a	1.9	0.0	3.5	3.4
Cross Lake ^b	1.0	1.0	2.0	6.0
Granville Lake ^a	5.0	4.0	8.0	6.0
Nelson House ^b	1.0	2.5	1.0	4.0
Pukatawagan ^a	3.5	4.7	2.3	10.1
South Indian Lake ^b	2.0	2.0	15	7

^aSocial and Economic Impact Study of the Churchill-Nelson River Hydro Development, 1974

^bChurchill River Study, 1975

In many cases, declining resources and the encroachment of industrialization and development has made it difficult to maintain an economy based solely on traditional activities. This encroachment has resulted in the destruction of the family working group as an economic factor. Many of the Zone's residents rely on a combination of traditional pursuits coupled with seasonal wage employment and transfer payments.

The transfer payment economy of Zone communities is based on family allowance, old age pension, social assistance and other such payments. Social assistance payments generally result from a lack of attractive alternative income sources.

Two government agencies are involved with the dispursion of monies. The federal Department of Indian Affairs and Northern Development allocates monies to the Zone's treaty Indians while the Provincial Department of Health and Social Development services Non-treaty residents.

Social assistance payments to treaty residents totalled approximately 5.5 million dollars in 1977/78 representing an increase of 7.7 percent over the previous year. The average per capita payment was 416 dollars for the year 1977/78, however 60 percent of the Zone's band members received payments below this average (Table 5).

Economic¹⁰ welfare accounts for about 53 percent of the total federal assistance to the treaty Indians of the Zone. Social¹¹ assistance 23 percent, health payments 19 percent and miscellaneous monies about 5 percent.

The total payments made to non-treaty residents by the Department of Health and Social Development for the year 1974 amounted to 1.2 million dollars.¹² Assistance payments ranged from a low of \$150/recipient at Norway House to a high of \$2,451/recipient in Brochet.

The transfer payment economy is tied closely to both traditional pursuits and the wage economy. The seasonality of traditional activities such as fishing and trapping is directly reflected in the dispersal patterns of social assistance. The largest amount of welfare paid out tends to peak in the months of highest unemployment. In the period 1974 to 1976, the months of January and October showed the largest assistance payments.

The major employer in the planning zone is the mining industry, employing over six thousand people. Manitoba Hydro, Manitoba Forest Resources (ManFor) Ltd. and the school system each employ approximately one thousand people.

Specific incomes by employer by location are not available, however, the provincial averages by industry type are given in Table 6.

Incomes in the seven government districts (LGD's) was 11,817 dollars in 1975, significantly above most southern Manitoba communities. The average income for these LGD's has increased by an average of over 81 percent since 1971 (Table 7).

¹⁰ Such as unemployment

¹¹ Such as pensions and family allowance

¹² Last year of available generalized information

¹³ Average income (1975) for 50 southern communities including Brandon, Portage and Dauphin was 9611 dollars

Table 5

Social Assistance to Indian Bands
in the Mid-North

Band Name	1974-75	\$/capita	1975-76	\$/capita	1976-77	\$/capita	1977-78	\$/capita
Norway House	\$714,859	269	\$859,741	324	\$1,231,586	526	\$1,252,617	524
Cross Lake	746,645	396	974,552	531	1,158,710	566	1,263,830	606
The Pas	257,645	211	297,777	251	381,897	317	402,998	333
Fox Lake	34,175	114	60,147	201	76,143	250	83,192	269
Split Lake	286,063	277	461,755	498	512,418	460	582,328	502
Nelson House	340,607	198	622,118	363	563,412	310	595,862	318
Grand Rapids	63,377	201	70,082	222	43,913	134	59,323	174
York Landing	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-
Mathias Colomb	103,459	389	243,430		470,731	421	529,805	452
Moose Lake	128,432	389	148,376	449	136,193	422	149,293	482
Chemahawin	77,793	192	104,051	256	81,136	184	92,279	205
Barren Lands	163,749	266	344,314	559	434,861	674	474,856	718
TOTAL	2,916,804		4,186,343		5,091,000		5,486,383	

Source: Canada, Department of Indian Affairs and Northern Development, Social Development Section,
Manitoba Region

Table 6

Average^a Annual Income by Industry
(,000 of Dollars)

	Mining	Trade	Service	Transportation and Utilities	Forestry	Teachers
1972	9.8	5.8	5.0	8.2	n.a	n.a
1973	10.5	6.2	5.2	8.8	11.4	10.8
1974	11.4	6.9	5.6	10.1	13.6	12.0
1975	13.5	7.9	6.4	11.5	15.9	14.2
1976	14.9	8.7	7.2	13.0	14.5	15.9
1977	16.1	9.3	7.8	14.5	n.a	n.a
Percent Increase	+63.9	+61.3	+56.4	+77.2	+27.1 ^b	+47.0 ^b
Annual Percent Increase	+10.7	+10.2	+ 9.4	+12.9	+ 6.8	+11.7

Source: Modified from Manitoba Statistical Review, 3rd quarter, 1978

^aFor all of Manitoba

^bOver four years

n.a. not available

Table 7

Incomes of Mid North Local Government Districts

	Average Income 1971	1975
L.G.D. of Flin Flon	\$5,523	\$11,097
L.G.D. of Consol	5,640	10,465
L.G.D. of Mystery Lake	7,170	11,856
L.G.D. of Snow Lake	6,084	12,018
L.G.D. of Lynn Lake	7,516	12,770
L.G.D. of Grand Rapids	5,171	9,185
L.G.D. of Gillam		15,325

Source: Manitoba Community Reports, 1977; Dept. of
Industry, Trade and Commerce

An integral consideration in the economy of the north is the cost-of-living. Because of the isolation and great distance from Winnipeg of the communities in the Planning Zone, the cost-of-living is considerably higher than the southern part of the province. In 1978 gasoline prices were approximately \$.10 in The Pas to \$.29 in Gillam higher than in Winnipeg (See Table 8). Food prices and home heating in the Mid-North are also higher than in the Southern part of the province. Food prices as of 1977 were 10% higher and home heating ranged from 10-41% higher as of March 1978 (Table 9 and 10).

Table 8

Average Gasoline Prices for Selected Mid North Communities^a

	1976			1977		1978	
	Oct.	Dec.	Mar.	June	Sept.	Dec.	Mar.
Flin Flon	95.0	95.4	96.4	96.3	98.8	98.1	101.1
Gillam	98.7	103.7	108.9	108.0	116.0	116.0	121.0
Grand Rapids	98.2	98.2	99.4	98.2	104.0	104.3	107.8
Leaf Rapids	108.0	108.0	112.8	113.8	117.4	117.4	112.7
Lynn Lake	94.7	99.9	103.6	106.8	99.4	108.6	112.3
Snow Lake	N/A	N/A	N/A	N/A	N/A	107.5	111.8
The Pas	96.4	96.3	99.6	99.7	102.9	102.9	102.1
Thompson	100.9	101.1	105.0	105.4	108.8	107.7	112.0
Winnipeg	81.2	80.7	85.1	81.8	85.1	89.1	91.5

^aRegular gas in cents/gallon

SOURCE: Manitoba Statistical Review, 1st quarter, 1978
4th quarter, 1976
3rd quarter, 1977

Table 9

Food Price^a Index for Selected Mid North Communities

	1976		1977		Annual Average	
	June	Dec.	June	Dec.	1976	1977
Cross Lake	N/A	N/A	128.3	N/A	N/A	N/A
Flin Flon	109.5	110.9	111.8	111.8	103.2	112.0
Gillam	120.6	123.7	113.9	119.6	103.2	111.9
Grand Rapids	N/A	N/A	114.1	116.2	N/A	N/A
Leaf Rapids	115.1	117.5	112.9	114.0	104.8	113.9
Lynn Lake	112.6	115.7	110.5	114.4	102.3	109.6
Norway House	132.1	132.2	126.7	118.4	N/A	N/A
Snow Lake	108.1	N/A	109.7	113.4	N/A	N/A
Split Lake	133.2	107.0	134.7	138.9	N/A	N/A
The Pas	106.4	106.3	102.9	106.6	102.2	107.7
Thompson	104.8	116.2	104.7	104.5	102.7	110.7
Wabowden	115.8	105.4	112.9	115.6	N/A	N/A

^a Food for home consumption, Winnipeg = 100

Source: Manitoba Statistical Review, 1st quarter, 1978

Table 10

Domestic Heating Commodity Indices For
Selected Mid North Communities

	Fuel Oil			Propane ¹			Electricity ²	
	Dec. 1976	Sept. 1977	Mar. 1978	Dec. 1976	Sept. 1977	Mar. 1978	Dec. 1976	Sept. 1977
Flin Flon	109.6	109.4	108.9	107.0	92.9	105.8	106.8	109.8
Gillam	119.5	120.1	118.0	135.6	120.9	133.9	109.6	115.7
Grand Rapids	116.0	115.2	115.3	111.9	118.8	118.8	109.6	130.9
Leaf Rapids	124.9	123.6	121.4	139.3	120.9	133.9	109.6	115.7
Lynn Lake	118.0	117.7	115.8	N/A	123.1	133.9	109.6	115.7
Snow Lake	N/A	N/A	103.1	N/A	N/A	100.0	109.6	N/A
The Pas	108.7	108.8	102.1	107.7	92.9	105.8	109.6	115.7
Thompson	115.2	114.2	114.6	139.3	120.9	133.9	106.8	109.8
								110.4

Winnipeg = 100

¹ Natural gas available only in Snow Lake

² Based on 650 kwh and service charge

N/A Data not available

Source: Manitoba Statistical Review, 4th quarter 1976

3rd quarter 1977

1st quarter 1978

Services

Services available in each community vary generally with the degree of development and population. Services include protection and administration, education, recreation, cultural, health and communications. Electrical services are shown on Map 2 (Table 11).

PROTECTION AND ADMINISTRATION: The planning zone is under the jurisdiction of the Royal Canadian Mounted Police. Detachment headquarters are located in a number of centres and neighboring communities are patrolled on a regular basis. In areas where an Indian Reservation is located near or included within a settlement, an appointed Band Constable is associated with the detachment.

Fire fighting service is provided in Thompson, The Pas, Flin Flon, Lynn Lake, Leaf Rapids, The Pas Reserve and Wabowden. Volunteer services are available in Gillam, Snow Lake, Cranberry Portage, Grand Rapids and Ilford. The remaining communities have no fire department organization.

Conventional ambulance service is provided in Thompson, The Pas, Flin Flon, Lynn Lake, Gillam, Leaf Rapids, Snow Lake and Grand Rapids. In emergency cases, aircraft are used to transport patients to hospital.

Provincial administrative services are located in one half of the zones communities. Department of Public Works and Highways, Agriculture, Renewable Resources and Manitoba Hydro are examples of offices located in Thompson, The Pas, Lynn Lake and Leaf Rapids (Table 12).

EDUCATION: Education facilities are available to all communities even though all disciplines may not be taught in each community. Kindergarten, elementary and/or secondary school facilities are present in all but two communities. Students from Wanless are transported to either The Pas or Cranberry Portage to attend school. Granville Lake students attend school at Lynn Lake or Leaf Rapids. Total school enrollment for the Planning Zone for 1977-78 term was 16,461 students (Table 13). Community college in The Pas offers career oriented courses as well as adult basic education and special programs (Table 14). A number of educational grants are provided by the provincial government to northern school

Table 13

School Enrollment 1977/78 for Zone Communities

Community	Students	Teachers
Thompson	4,183	221
The Pas	2,947	155
Flin Flon	1,936	112
Lynn Lake	588	34
Gillam	461	29
Norway House	852	56
Leaf Rapids	647	38
Snow Lake	468	28
Cross Lake	736	35
Nelson House	480	22
The Pas Reserve	attend in The Pas	
Cranberry Portage	387	29
Wabowden	274	16
Split Lake	353	14
Moose Lake	316	16
Brochet	203	12
Pukatawagan	261	13
Easterville	238	10
South Indian Lake	313	20
Grand Rapids	354	21
Cormorant	168	10
Thicket Portage	54	4
Pikwitonei	63	3
Ilford	47	3
York Landing	72	4
Sherridon	41	3
Wanless	attend in The Pas	
Granville	19	2
Total	14,541	910

Personal Communication

- Frontier School Division,
- Department of Education, and
- Canada, Department of Indian Affairs
and Northern Development

Table 14
Keewatin Community College Enrollment

	Jan. 1/76 Dec.31/76	Jan. 1/77 Dec. 31/77
Adult Basic Education	535	738
Career Occupational		
Pre-employment		
- Day	388	519
- Evening	2,625	1,147
Apprentice Training	448	452
Short Courses	84	80
Community Services	207	76
TOTAL KEEWATIN COMMUNITY COLLEGE	4,287	3,012

Source: Dept. of Continuing Education and Manpower
Annual Report 1977-78.

divisions on a per teacher and per pupil basis. In 1976-77 Frontier School Division received 2,180 dollars per teacher and 431 dollars per student to cover costs such as maintenance, administration and student services. Grants to northern schools for the 1976-77 term totalled 614,910 dollars. In recognition of the higher cost of living in northern Manitoba the school divisions in the Mid North received the following grants:

Mystery Lake (Thompson)	\$215,320
Kelsey (The Pas)	\$155,679
Flin Flon	\$111,522
Lynn Lake	\$ 38,162
Snow Lake	\$ 32,673
Leaf Rapids	\$ 31,701

The Provincial New Careers Program was initiated in 1970 to help disadvantaged persons enter the job market. Educational courses and on-the-job training are provided in a variety of disciplines. In 1977-78 the program operated in the following communities:

The Pas	Moose Lake	Gillam
Thompson	Brochet	Cranberry Portage
Wabowden	Thicket Portage	South Indian Lake
Grand Rapids	Norway House	Cross Lake
Ilford	Pikwitonei	Split Lake
Easterville	Sherridon	
Leaf Rapids	Nelson House	

HEALTH SERVICES: The only extended care hospital facility in the zone is available at Thompson. There are five other general hospitals located in The Pas, Flin Flon, Lynn Lake, Gillam and The Pas Reserve. Medical nursing units are located in Lynn Lake, Gillam, Norway House, Leaf Rapids, Snow Lake, Cross Lake, Nelson House, Cranberry Portage, Wabowden, Split Lake, Moose Lake, Brochet, Pukatawagan, Easterville, South Indian Lake, Cormorant, Grand Rapids, Thicket Portage, Pikwitonei, Ilford, York Landing and Sherridon. There are permanent physicians located in Thompson, The Pas, Flin Flon, Lynn Lake, Gillam, Snow Lake and The Pas Reserve. Transportation plays a vital role in health services to northern Manitoba. In emergency situations, patients are flown to the nearest medical centre.

CULTURAL SERVICES: Twenty communities have a hall as their sole cultural centre. Public libraries are found in seven communities: Thompson, The Pas, Flin Flon, Lynn Lake, Gillam, Leaf Rapids and Grand Rapids. Elementary and secondary schools in many communities have resource oriented libraries, however, these are not available for public use. There are two museums in the Planning Zone, the Little North Museum in The Pas and the Flin Flon Museum. There are theatre facilities in Thompson, The Pas, Lynn Lake, Gillam, Flin Flon and Leaf Rapids. Urban recreational facilities available to local residents range from a single playing field to large indoor complex such as the one at Leaf Rapids.

COMMUNICATIONS SERVICES. The basic network of communication in the Mid North consists of telephone, television, radio, postal and newspaper services. The Manitoba Telephone System (M.T.S.) provides service to all zone communities. Direct distance dialing is available to all except Split Lake, Moose Lake, Pukatawagan, South Indian Lake, Cormorant, Ilford, York Landing, Sherridon and Wanless which are operator assisted. Radio telephone communication of the beam type is used in Brochet, Easterville, Pikwitonei and Granville. Brochet and Granville Lake are the only two communities which do not receive television broadcasts. The CBC network has 11 satellite stations located at The Pas, Grand Rapids, Gillam, Leaf Rapids, Lynn Lake, Thompson, Ilford, Snow Lake, Norway House, Wabowden and Flin Flon. The CTV network has recently expanded its service to northern centres such as The Pas and Thompson.

The major newspapers in the zone are:

Community	Name
Lynn Lake	Northern Breeze
The Pas	Pasquia Times
Thompson	Nickel Belt News
Thompson	Citizen
Flin Flon	Daily Reminder

Land Use Commitments

Land and the resources on and under the land within the Mid-North are presently committed through easements, leases, licences, permits and reserves. Land tenure is divided between private and governmental control, private ownership being limited to relatively small parcels located in and around the several communities. Provincial Crown Lands are administered by the Lands Branch of the Department of Mines, Natural Resources and Environment. At the present time (1978) most Crown lands in the Zone have some type of encumbrance. The areas of land commitment are given in Table 1.

Table 1

Areas of Land Commitments in The
Mid North Planning Zone

Commitment	Area Km ²	(Square Miles)
Indian Reserves	311	(120)
Wildlife Management Areas	3,196	(1,234)
Parks (Established)	3,111	(1,201)
Timber Rights	93,240	(36,000)
Trapping Sections	Entire Planning Zone	
LGD Lands	11,914	(4,600)
Northern Affairs Lands	34	(13)
Active Mining Claim Areas	49,210	(19,000)
Provincial Forest	1,489	(575)
Community Pastures	88	(34)

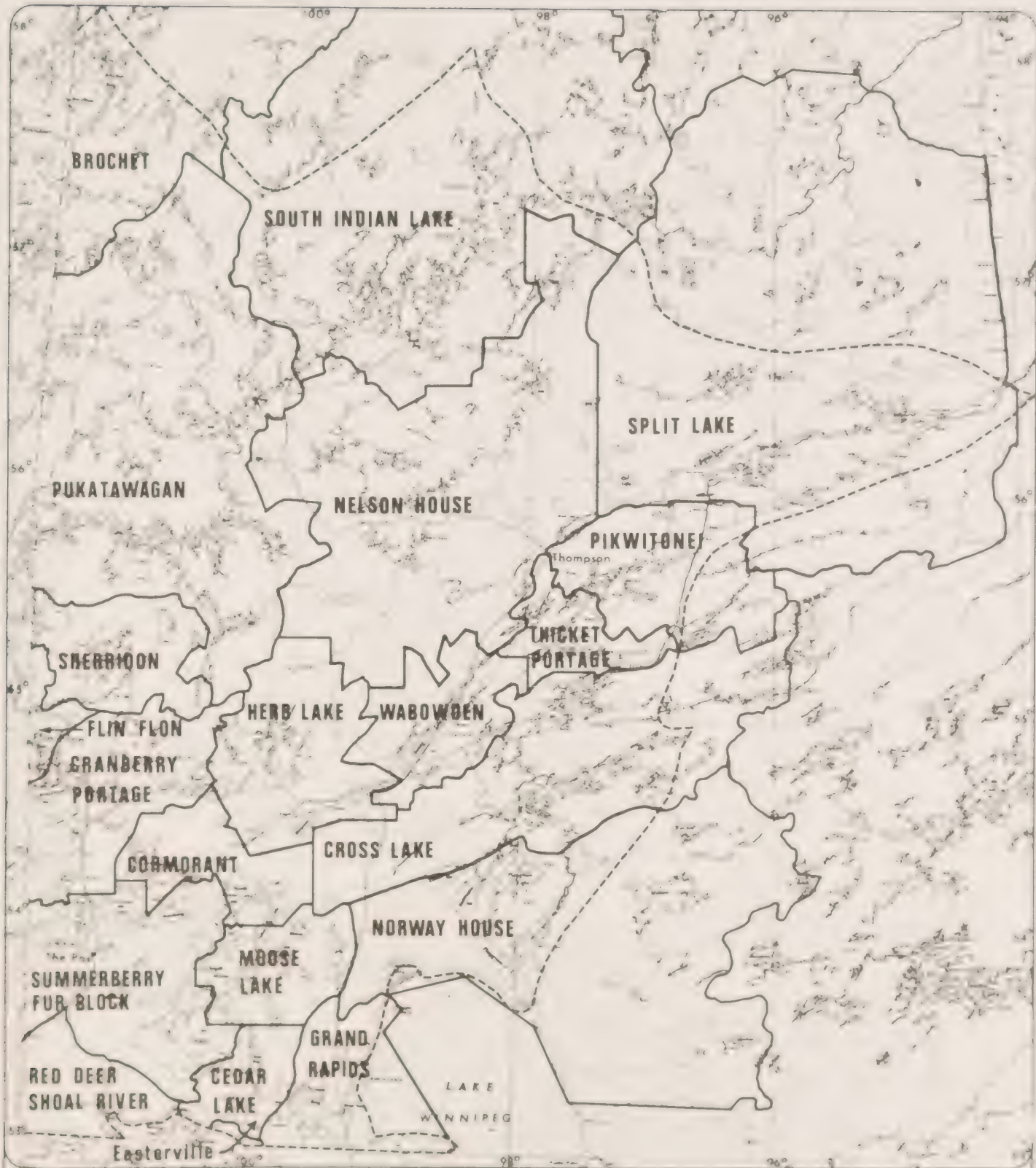
Trap Line Sections

Encompassing the entire planning zone are the Registered Trapline Sections (R.T.L.) which are designated by Order-in-Council and administered under the Wildlife Act.

Twenty R.T.L. Sections occur within the Mid-North Planning Zone (Map 1):

Brochet	Herb Lake	South Indian Lake
Cedar Lake	Moose Lake	Split Lake
Cormorant	Nelson House	Summerberry Fur Block
Cranberry Portage	Norway House	Thicket Portage
Cross Lake	Pikwitonei	Wabowden
Flin Flon	Pukatawagan	Red Deer/Shoal River
Grand Rapids	Sherridon	

Within each section are a number of blocks, the boundaries of which were determined by trappers when the system was established. Upon payment of a fee, a Registered Trapline Permit is issued which gives the trapper exclusive trapping rights within a designated block. Registered trappers do not own the land upon which they trap. All improvements made to the land are the property of the Crown in the Province of Manitoba.



REGISTERED TRAPLINE SECTIONS

**MAP 1.
LAND USE
COMMITMENTS
MID NORTH
PLANNING ZONE**

1 inch = 40 miles

Wildlife Management Areas

The Wildlife Management Areas (WMA) located within the Mid-North Planning Zone (Map 2) were established under Orders-in-Council. These areas were established to ensure protection of the fragile marsh-land and alluvial flats. Ducks Unlimited has a lease to manipulate water levels for waterfowl habitat improvement in the Saskeram W.M.A. The hunting, trapping or possession of fur-bearing animals in a W.M.A. is prohibited except under the authority of a special permit. The use of grasslands within the Saskeram has been allocated to individuals under various permits and leases.

Casual hay permits allocate land to occasional users for hay cutting for domestic purposes only. This type of permit is valid for one year.

Special hay permits are issued on Crown lands which are particularly valuable for hay production. Permittees cannot sell any hay without Ministerial permission.

Casual grazing permits (valid for one year) allocate Crown land for grazing or fodder.

Farm grazing leases are issued to farm operators requiring supplemental hay or fodder regularly. This type of lease extends for five years or longer and is designed to regulate grasslands and allow for improvements.

Cash Rental/Crop Share Lease where the lessee pays a flat rental on lease from 1-5 years and is responsible for payment of a fixed rent, taxes, and/or payment of a percentage of crop to the lessor.

Water Power Reserves

Seven Water Power Reserves occur within the Planning Zone (Map 3). Regulations under the Water Powers Act have allowed the Minister of Mines, Natural Resources and Environment to grant temporary permits, leases and licences on reserved lands. Ministerial consultation prior to the granting of privileges insures that the temporary use applied for will not interfere with the purpose of the water power reservation and permits are granted or withheld accordingly. As the land is required for water power development all privileges are cancelled. Land and all improvements revert to the Crown and the Minister may or may not grant compensation.



COMMITTED LANDS IN THE PLANNING ZONE

- WILDLIFE MANAGEMENT AREAS
- CORMORANT PROVINCIAL FOREST
- PROVINCIAL PARKS
- PROVINCIAL PARK RESERVES

MAP 2. LAND USE COMMITMENTS

MID NORTH
PLANNING ZONE

1 inch = 40 miles

Timber Rights

Early in 1966, Churchill Forest Industry (CFI), now Manitoba Forestry Resources Ltd. (ManFor) negotiated an agreement with the Provincial Government regarding the harvest of Crown timber. Within the area specified (Map 4), ManFor was given preferred but not exclusive cutting rights over the land. Mineral and water power rights were excluded. Lands exempted from ManFor cutting privileges were Indian Reserves, rights-of-way for highways and railroads, provincial parks and the Cormorant Forest Reserve. However, harvest of Crown timber in provincial parks has taken place with the permission of Parks Branch under the supervision of regional foresters. Special permits have also been issued for the Cormorant Forest.

Under the 'Forest Act' regulations, the corporation has been required to consult provincial foresters with an annual projected cutting plan. Upon approval, general permits are issued for site specific harvest.

The government may at any time withdraw land from the ManFor reserve, however, they are given the first opportunity of cutting any timber on such lands. Compensation is not paid to the corporation for losses or damage to timber due to water power development projects.

The International Nickel Company (INCO) reserved a tract of land and was granted exclusive timber rights within its boundaries for the purpose of production of mining timbers.

Mineral Reserves

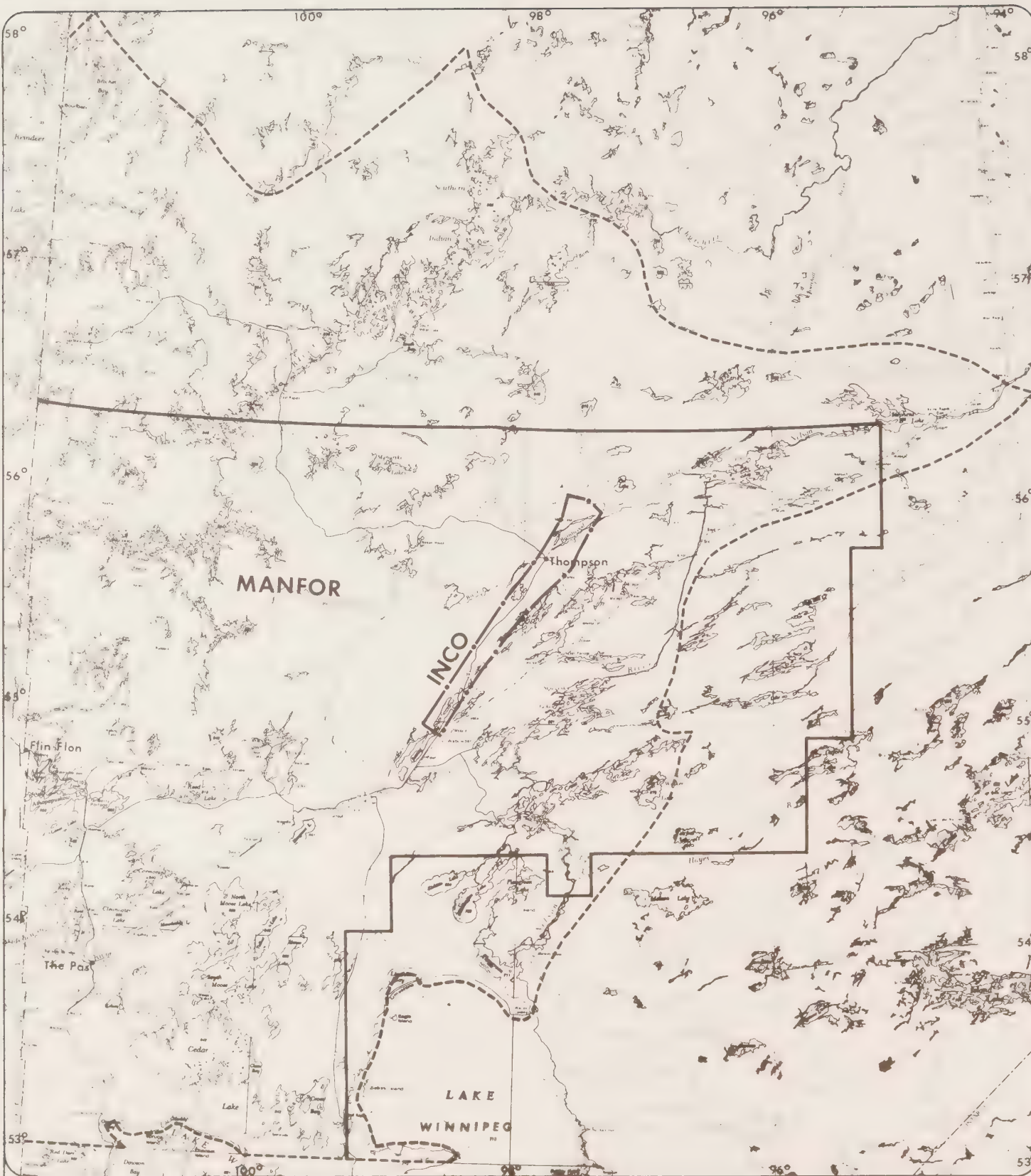
The Department of Mines, Natural Resources and Environment is responsible for the administration of the provinces mineral resources. Areas of active claiming are noted on Map 5. The disposition of mineral properties is by claim, claim block, exploratory leases, and production leases. All producing mines in the Mid-North Zone are operating under production leases or Order-in-Council leases.

Order-in-Council Leases

Flin Flon
Chisel Lake
Thompson
Osborne Lake
Stall Lake
Anderson Lake
Ghost-Lost Lake

Production Leases

White Lake
Centennial
Dickstone
Fox Mine
Birchtree
Manibridge

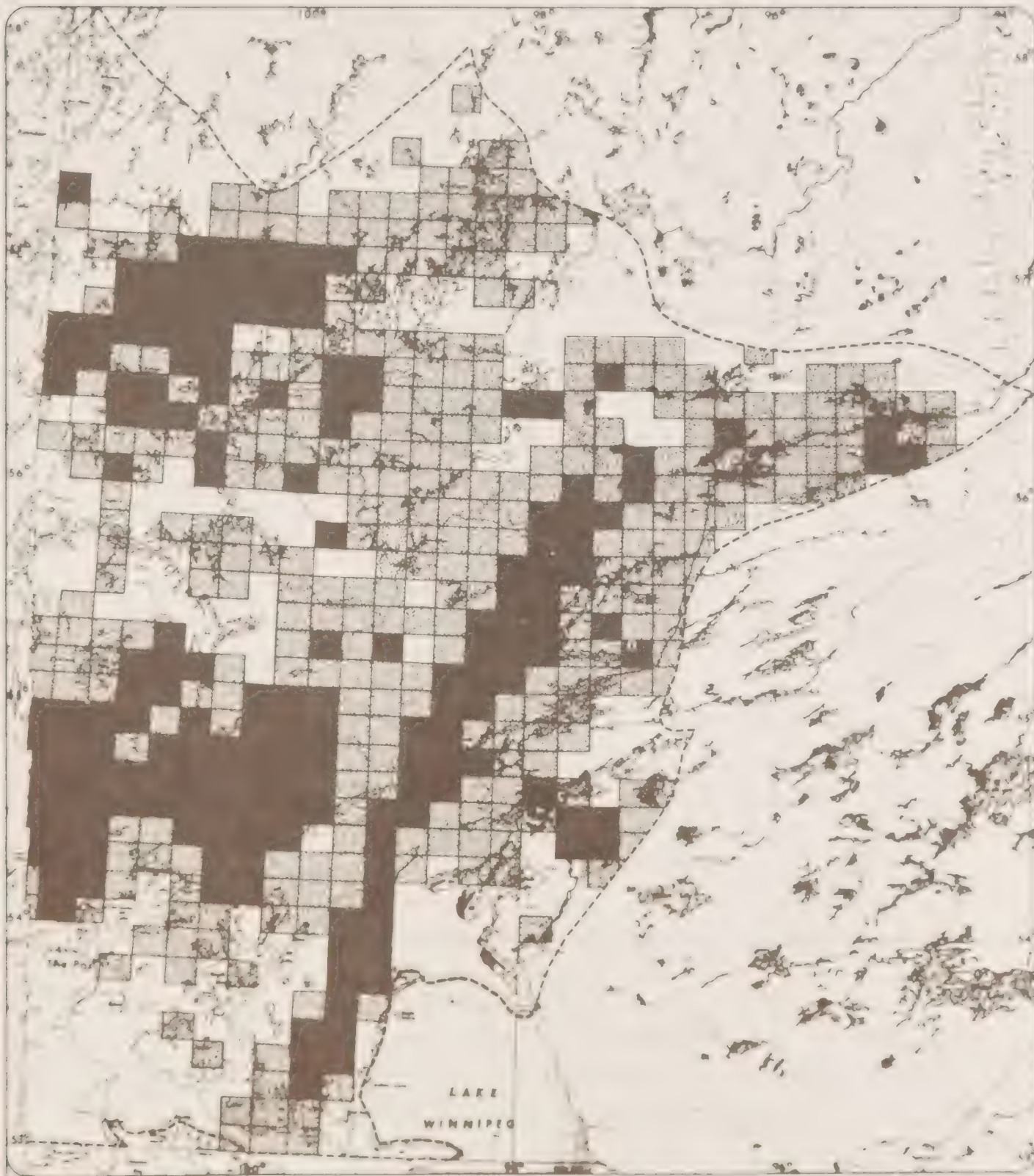


FORESTRY COMMITMENT BOUNDARIES

MANFOR $\approx 35,500$ SQ. MI.
INCO ≈ 800 SQ. MI.

MAP 4. LAND USE COMMITMENTS MID NORTH PLANNING ZONE

1 inch: 40 miles



MINERAL CLAIMING AREAS

ACTIVE



INACTIVE



MAP 5

LAND USE
COMMITMENTS

MID NORTH
PLANNING ZONE

Oct. 1978

Surface rights of mining properties may be granted or reserved, and Crown lands and mining rights may be withdrawn from prospecting and leasing at the discretion of the Minister.

Provincial Parks

Provincial Parks, recreation areas and waysides are administered under the Provincial Parks Lands Act. Clearwater and Grass River have been classified as Natural Parks.

Integrated land use occurs within the park system in the Mid-North Zone. The Minister of Natural Resources may grant leases or permits to the surface rights of any land within Provincial Parks. Applications for timber permits are made to the provincial foresters and passed to the Parks Branch for approval. Timber is presently being harvested in Paint Lake and Grass River Provincial Parks. With respect to mineral rights underlying park lands or surface rights of a mining claim within park lands, applications are made to the Director of Mines, then submitted to the Director of Parks for recommendation before issuance of a lease. Hunting and trapping are also permitted within park boundaries under permit or licence only.

Highways

Jurisdiction over right-of-ways established for Provincial Roads (P.R.) and Provincial Trunk Highways (P.T.H.) lies with the Department of Highways. The Department holds exclusive rights over sand and gravel within the established right-of-way. Individuals may apply to the Department for permits to remove sand and gravel within a right-of-way at a cost of ten cents (\$0.10) per yard. Permits have been issued in areas of surplus.

There is a variance in widths of right-of-ways along the all-weather road system within the Zone, ranging from 132 feet between The Pas and Prospector on P.T.H. No. 10 to 400 feet on P.R. 391 approaching Thompson. The remainder of P.R. 391 has an allowance of 300 feet.

Administrative Regions

The Mid-North Planning Zone lies within a number of provincial government administrative regions, some of which are shown on Map 6. These departments have varying amounts of jurisdiction over land and land use.

Local Government Districts

Seven Local Government Districts (L.G.D.) are located in the Zone (Map 7). Crown land is permitted by the Department of Natural Resources upon consultation with the L.G.D.

Indian Reserves

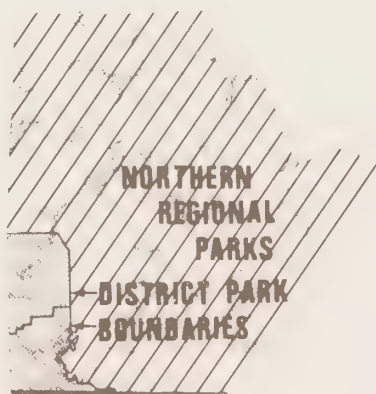
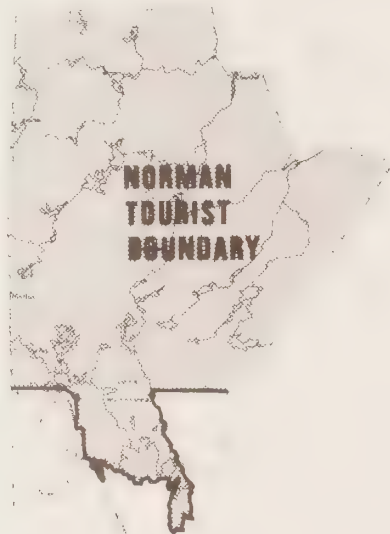
Indian Reserves occurring in the Planning Zone encompass an area of 311 km². Administration of Indian lands lies with the Federal Department of Indian Affairs and Northern Development (D.I.A.N.D.). Outstanding Indian land entitlements are being negotiated between the federal and provincial governments and the Band Councils. Map 8 illustrates the areas of outstanding entitlement for Bands in the Planning Zone.

Community Pastures

There are two community pastures (one active), both located in the Pasquia Valley southwest of The Pas (Map 9).

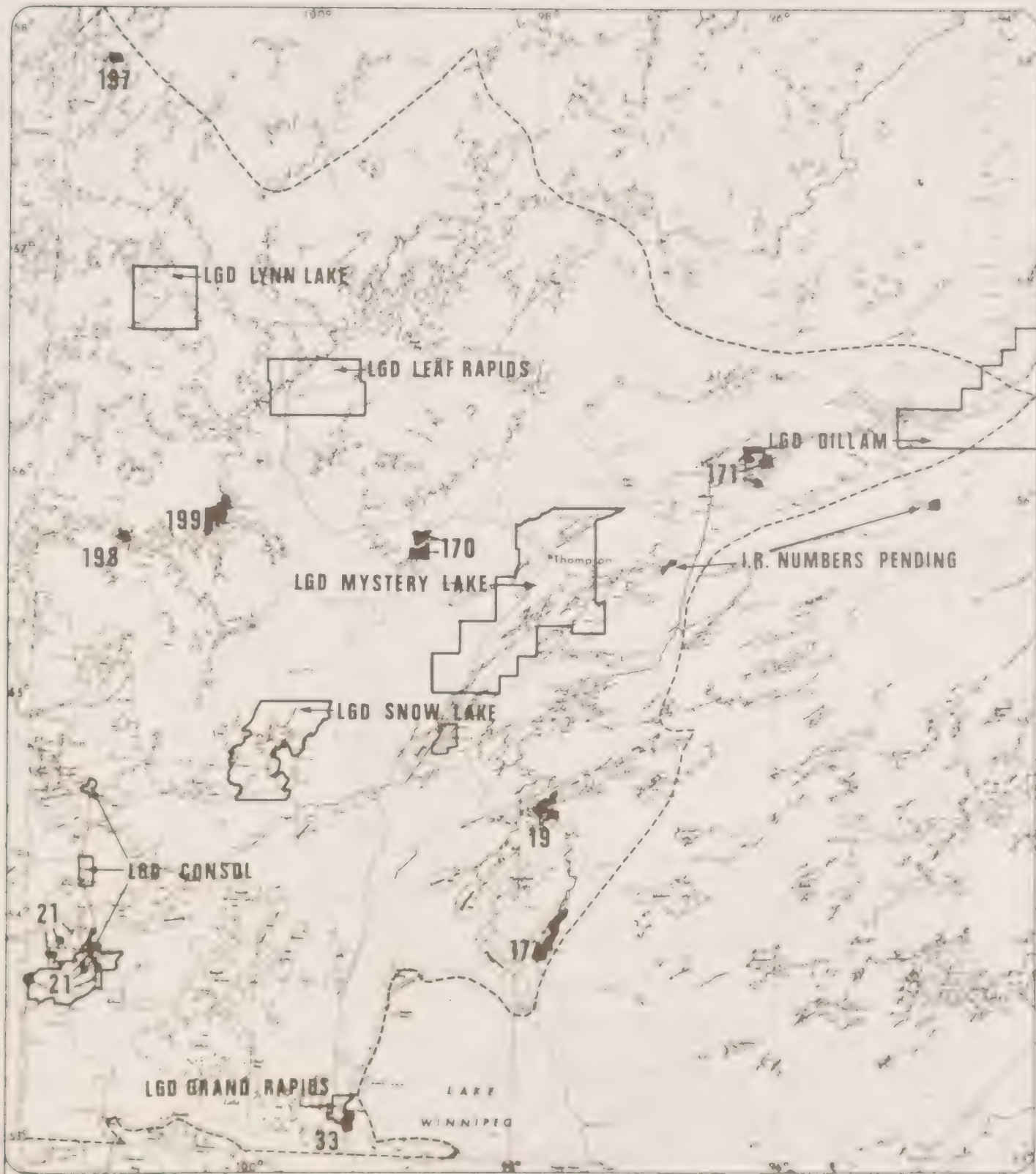
Electoral Boundaries

The majority of land in the Mid North falls in the Churchill Federal riding although although Grand Rapids and Easterville are in the Selkirk-Interlake riding (Map 10). There are five provincial ridings in the zone, as shown on Map 11.



**ADMINISTRATIVE
BOUNDARIES**

**MAP 6.
LAND USE
COMMITMENTS**

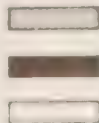


**GOVERNMENT DISTRICTS &
INDIAN RESERVES**

NORTHERN AFFAIRS

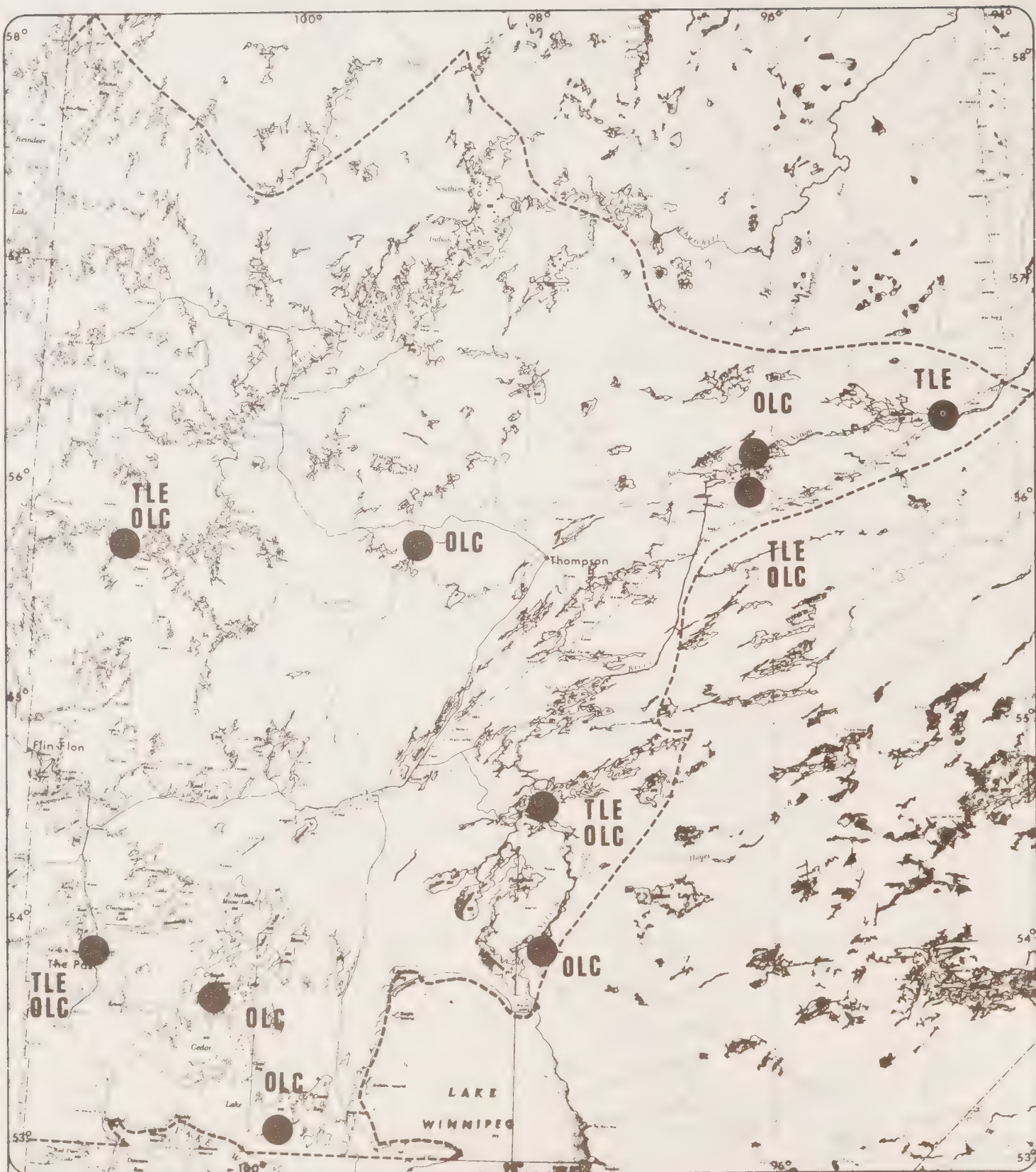
INDIAN RESERVES (I.R.)

**LOCAL GOVERNMENT DISTRICTS
-as per June 1976**



**MAP 7.
LAND USE
COMMITMENTS
MID NORTH
PLANNING ZONE**

1 inch = 40 miles



COMMUNITIES WITH LAND CLAIMS, 1978

TYPE

TLE Treaty Land Entitlement

OLC Other Land Claims

MAP 8.

**LAND USE
COMMITMENTS**

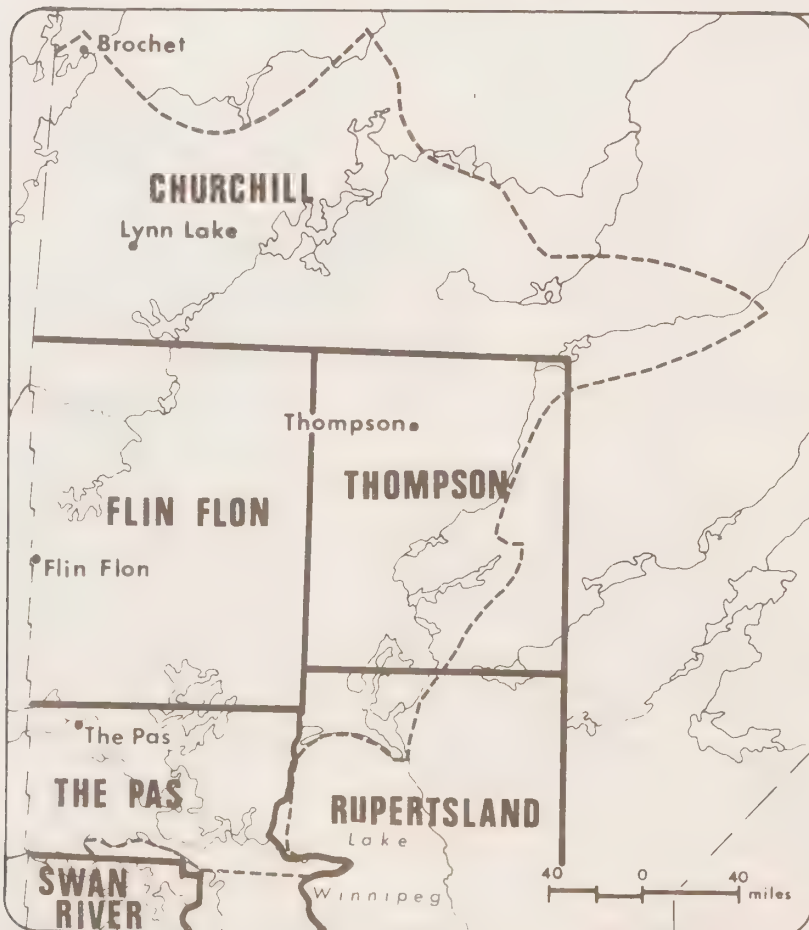
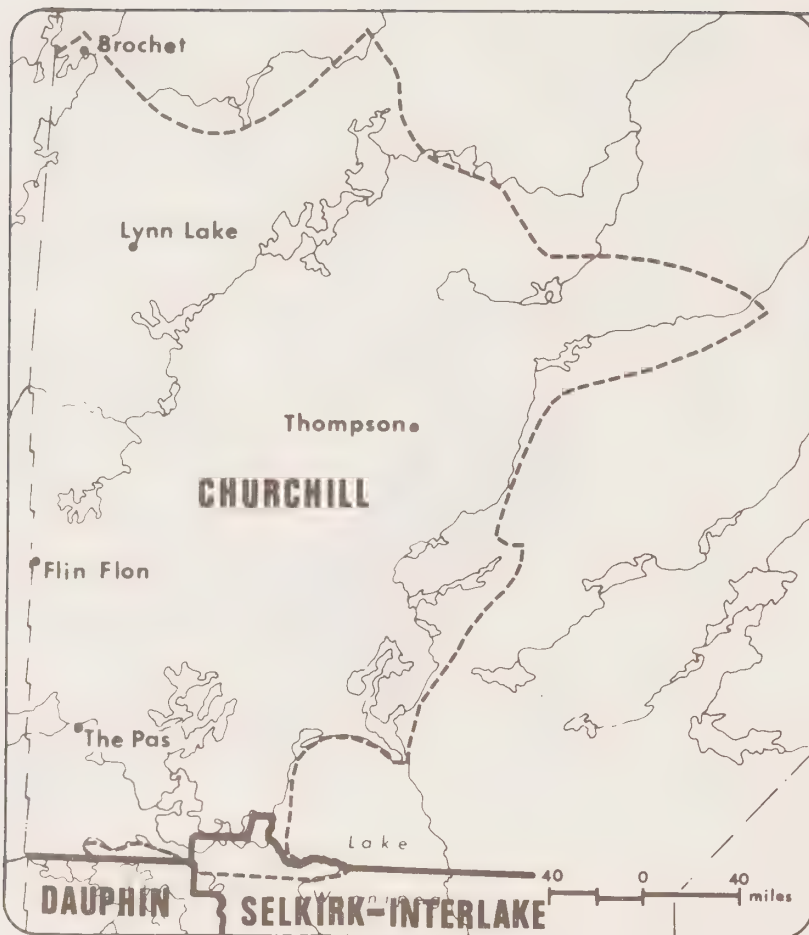
**MID NORTH
PLANNING ZONE**

MAP 9. LAND USE COMMITMENTS

PASQUIA LAND SETTLEMENT PROJECT

COMMUNITY PASTURES







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This bibliography is a listing of documents relevant to resource planning in Northern Manitoba. It is primarily comprised of works written since 1950 and deals with that portion of the Province of Manitoba north of the 53rd parallel.

The bibliography is divided by subject and titles are arranged alphabetically by author within each subject. In some cases where the work touches on several subjects, it is included under each appropriate section. In cases where the same author has more than one title under the same heading, the titles are listed chronologically.

Titles listed as manuscript reports are usually government reports whose initial publication is of a limited nature and usually reflects the preliminary nature of research. Where the government department is named, unless otherwise specified, it is assumed to be a Manitoba Government department. Journals cited are listed at the back (See Format). Abbreviations used are as follows:

- No. - Number
- Dept. - Department
- pp - Pages
- Inc. - Incorporated
- n.d. - No date
- M.A. - Master of Arts
- M.Sc. - Master of Science
- Ltd. - Limited

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Appendices

Appendix A: Meteorology

Table 1

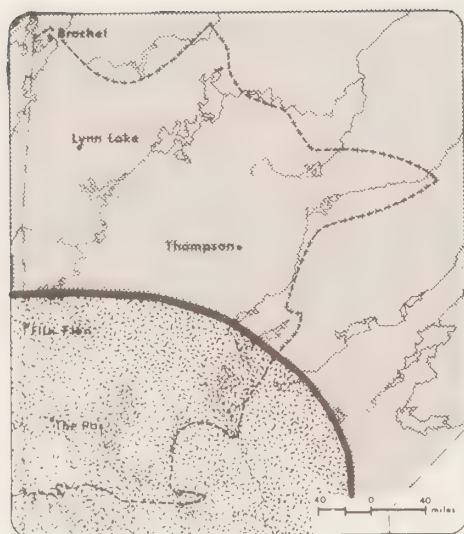
Normal^a Number of Days With Frost

Location	May	June	July	August	September	Sub Total	Annual Total
Brochet	22	4	0	0	6	32	234
Flin Flon	10	1	0	0	4	15	205
Gillam	24	8	*	1	12	45	249
Laurie River	22	4	*	1	9	36	237
Lynn Lake	19	4	0	*	10	33	236
Norway House	16	4	0	0	7	27	223
Pasquia	12	1	0	*	8	21	220
The Pas	10	1	0	0	5	16	210
The Pas Airport	13	1	0	0	4	18	212
Wabowden	18	2	0	*	6	26	226
Wanless	16	4	1	2	9	32	230

Source: Environment Canada, 1975

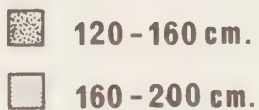
^a 'Normal' based on most number of available years of data (up to 30 years) for the period from 1941 to 1970

* Less than 1



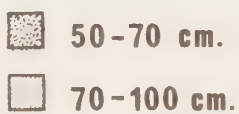
**MAP 1.
APPENDIX A**

SNOWFALL*



**MAP 2.
APPENDIX A**

MEAN MAXIMUM DEPTH OF SNOW*



* Source: Fisheries and Environment Canada, 1978

Appendix A

Table 2

Normal^a Monthly Degree Days^b (From 18°C)

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Churchill	1412	1259	1183	866	642	359	192	204	367	586	903	1238	9193
Dauphin	1154	945	842	459	215	93	30	52	193	367	688	996	6070
The Pas	1251	1020	901	544	315	124	38	72	242	435	766	1098	6806
Winnipeg	1126	951	806	439	233	73	21	37	173	354	670	981	5864

Source: Environment Canada, 1975

^aNormal based on most number of years of available data (up to 30 years) for the period 1941 to 1970

^bDegree day is the difference (below) in temperature between the daily mean and 18°C (65°F)

Appendix A

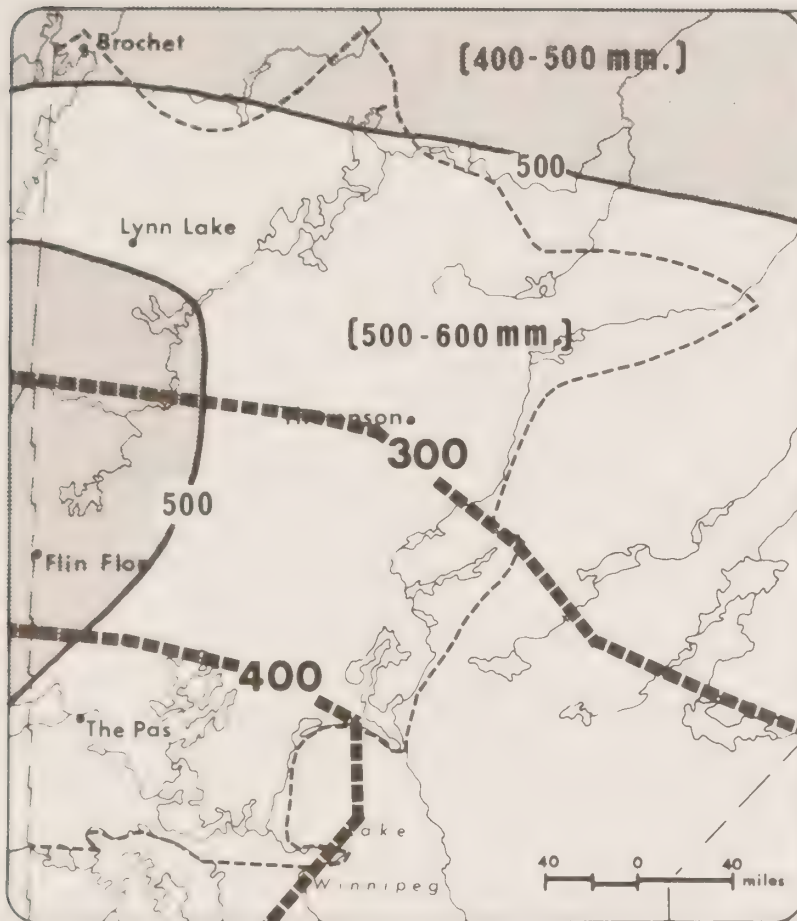
Table 3

Normal^a Mean Snowfall (centimetres)

Location	January	February	March	April	May	June	July	August	September	October	November	December	(cm) Annual Total	(in) Annual Total
Brochet	20.6	13.2	20.6	19.3	15.0	2.0	0.0	0.0	2.3	20.6	30.0	25.1	168.7	66.4
Flin Flon	20.6	19.8	22.9	11.9	3.0	0.5	0.0	0.0	0.5	8.4	26.7	22.9	137.2	54.0
Gillam	14.2	11.9	16.5	13.0	12.2	2.0	0.0	0.3	3.3	19.1	25.9	17.8	136.2	53.6
Laurie River	26.2	17.8	20.8	15.7	8.1	2.0	0.0	0.0	3.3	14.5	35.1	32.8	176.3	69.4
Lynn Lake	17.5	15.2	19.3	21.3	6.4	1.3	0.0	0.0	1.3	13.5	26.9	23.4	146.1	57.5
Norway House	16.3	19.6	19.8	13.2	2.8	0.3	0.0	0.0	3.8	7.1	31.5	28.2	142.6	56.1
Pasquia	19.6	17.0	22.1	12.7	2.5	0.5	0.0	0.0	1.3	8.9	23.9	24.4	132.9	52.3
The Pas	24.9	22.6	21.8	14.0	3.6	T ^b	0.0	0.0	1.8	9.9	32.0	25.9	156.5	61.6
The Pas Airport	21.3	19.6	23.4	18.5	4.8	0.5	0.0	0.0	1.8	10.2	30.2	26.9	157.2	61.9
Wabowden	19.3	16.0	17.8	19.8	5.8	1.5	0.0	0.0	0.8	13.2	25.9	23.6	143.2	56.4
Wanless	22.4	18.3	20.1	14.5	3.6	0.5	0.0	0.0	1.5	9.1	34.5	24.9	149.4	58.8

Source: Environment Canada, 1975

^a 'Normal' based on most number of years of available data (up to 30 years) for the period from 1941 to 1970^b Trace

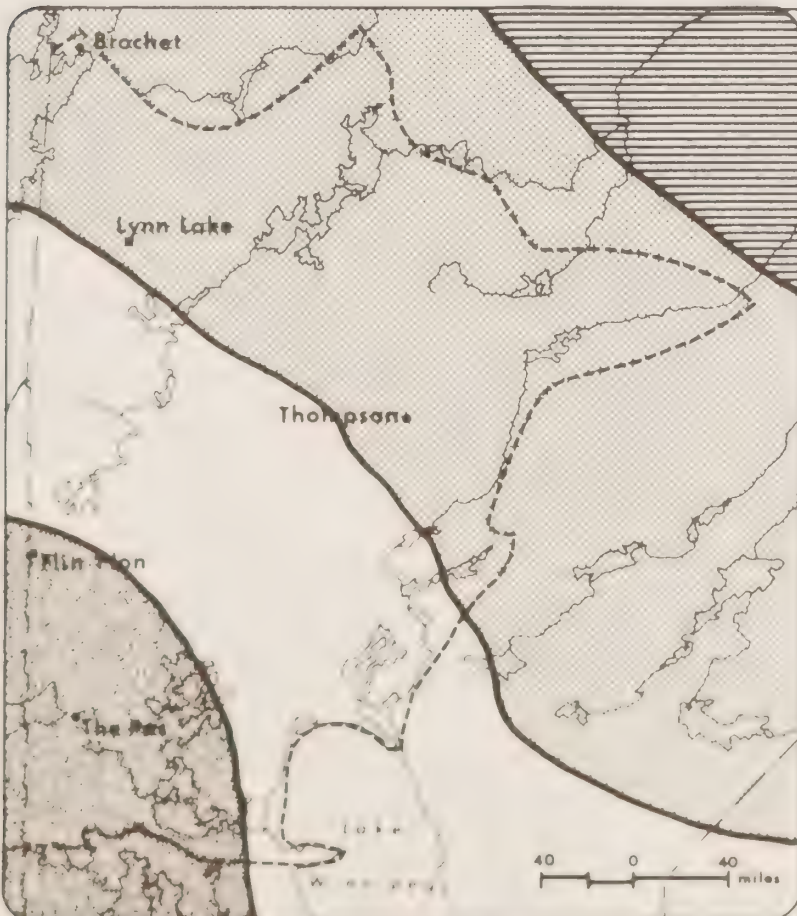


**MAP 3.
APPENDIX A**

WATER BALANCE (mm).*

**— ANNUAL
PRECIPITATION**

**- - - ANNUAL
EVAPOTRANSPIRATION**



**MAP 4.
APPENDIX A**

**MEAN ANNUAL LAKE
EVAPORATION (mm).***

▨ 200-300

□ 300-400

▤ 400-500

▩ 500-600

*Source: Fisheries and Environment Canada, 1978

Appendix A

Table 4

Normal^a Mean Daily Temperature (°C)

Location	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Brochet	-29.1	-24.3	-17.5	-6.0	2.9	10.8	15.3	14.0	7.2	0.0	-12.8	-22.8	-5.2
Flin Flon	-21.8	-17.7	-10.4	0.2	8.2	14.4	18.3	16.6	9.9	3.6	- 8.3	-17.7	-0.4
Gillam	-26.3	-23.3	-16.4	-6.4	2.8	9.9	14.9	13.3	6.7	0.2	-11.9	-21.6	-4.8
Laurie River	-24.4	-20.8	-13.2	-3.1	4.9	11.8	15.7	13.9	7.9	1.6	-10.7	-20.1	-3.0
Lynn Lake	-27.1	-22.7	-15.3	-4.2	4.9	12.1	15.8	13.7	7.3	0.4	-12.8	-22.4	-4.2
Norway House	-24.3	-20.2	-13.5	-1.6	6.6	13.4	17.2	15.9	9.6	3.0	-9.8	-19.7	-2.0
Pasquia	-23.6	-19.6	-12.2	-0.4	8.5	14.6	17.6	15.8	9.7	3.3	-8.9	-18.1	-1.1
The Pas	-22.0	-18.3	-11.0	0.4	8.7	14.7	18.3	16.6	10.3	4.1	-7.9	-17.4	-0.3
The Pas Airport	-22.4	-18.3	-11.4	-0.4	7.7	14.0	17.9	16.3	10.2	2.8	-7.5	-17.4	-0.6
Wabowden	-24.1	-20.2	-12.4	-2.2	6.2	12.8	16.8	15.1	8.8	2.4	-9.8	-19.7	-2.2
Wanless	-23.6	-19.7	-10.7	-0.2	7.6	13.5	16.7	15.3	9.8	3.7	-8.8	-18.6	-1.3
Thompson ^b	-26.4	-22.3	-13.6	-2.7	5.5	12.0	14.7	13.7	6.8	4.3	-11.4	-22.8	-3.5
Grand Rapids ^b	-22.4	-17.4	-9.9	2.2	6.9	14.2	17.2	18.5	10.6	3.6	-6.4	-16.4	0.7

Source: Environment Canada, 1975

^a'Normal' based on most number of years of available data (up to 30 years) for the period from 1941 to 1970^bBased on years 1967-1974



MEAN ANNUAL WIND DIRECTION - % FREQUENCY

FREQUENCY DIRECTION FROM

< 20 %

20 % - 25 %

> 25 %

(no's. refer to % calm)

MAP 5. APPENDIX A

MID NORTH
PLANNING ZONE

1 inch: 40 miles

Appendix A

Table 5

Mid North Active Meteorological Stations

Station	Long.		Lat.		Elevation (Feet)	Daily Observations	A	B	C	D	E	F	G
	o	1	o	1									
Brochet	57	53	101	40	1,150	1	X	X	X				
Jenpeg	54	35	98	02	700	2	X	X	X				
Flin Flon	54	46	101	51	1,098	2	X	X					
Flin Flon A	54	41	101	41	968	2	X	X	X				
Gillam	56	21	94	42	472	2	X	X	X				
Grand Rapids	53	11	99	16	730	1	X	X	X			X	X
Grand Rapids Hydro	53	09	99	17	730	2	X	X	X				
Kettle	56	23	94	39	477	2	X	X					
Lynn Lake	56	52	101	04	1,162	1	X	X	X				X
Missi Falls	57	19	98	06	884	2	X	X					
Norway House	54	00	97	48	712	2	X	X	X			X	
Norway House A	53	58	97	50	734	1	X	X					
Notigi	55	54	99	22	860	2	X	X					
Pasquia PFRA	53	43	101	30	856	6	X	X	X				
Pickerel Narrows	56	13	100	35	870	2	X						
Ruttan Lake	56	37	99	37	1,000	2	X	X					
South Bay	56	40	99	00	928	2	X	X					
The Pas	53	58	101	06	894	1	X	X	X		X		X
Thompson	55	48	97	52	695	1	X	X	X	X	X	X	X
Wanless	54	11	101	22	855	7	X	X					

A - Precipitation
B - Temperature
C - Wind

D - Soil Temperature
E - Solar Radiation
F - Evaporation

G - Sunshine



MEAN LAKE DEPTH (METERS)

- ≤ 2 ★
- 2-4 ●
- 4-7 ■
- ≥ 7 ▲

MAP 1. APPENDIX B

MID NORTH
PLANNING ZONE

1 inch:40 miles



MAXIMUM LAKE DEPTH (METERS)

- < 10 •
- 10-20 •
- > 20 ●

MAP 2. APPENDIX B

**MID NORTH
PLANNING ZONE**

1 inch:40 miles



KNOWN NORMAL BREEDING RANGES
OF MID NORTH BIRD SPECIES

MAP 1.
APPENDIX C

Appendix C

The following is a list of animals of the class Aves (birds) known to or thought to occur within the Mid North Planning Zone.¹ The manner of occurrence of each species is also noted, the notable exception to this being migratory birds. Those species which do not normally occur within the zone for breeding or wintering seasons are generally not listed. Those species noted as transient are normally occasionally sited species which do not usually range into the zone.

¹From Godfrey 1966

Notes;

- W: Winters only in the Planning Zone.
 B: Occurs throughout zone, breeds within zone.
 T: Transient, occasional sightings, outside normal range.
 *: Scarce local permanent resident. Planning zone is within normal range, but species may not occur in the zone.
 O: Formerly "B" but now breeds rarely in local areas of the zone.
 Numbers: Numbers refer to breeding ranges on accompanying maps

<u>Common Name</u>	<u>Generic Name</u>	<u>Range</u>
Common Loon	Gavia immer	B
Arctic Loon	G. arctica	T
Red-Necked Grebe	Podiceps grisegena	E
Horned Grebe	P. auritus	B
Western Grebe	Aechmophorus occidentalis	E
Pied-Billed Grebe	Podiceps podiceps	B
White Pelican	Pelecanus erythrorhynchos	E
Double Crested Cormorant	Phalacrocorax auritus	E
American Bittern	Botaurus lentiginosus	B
Canada Goose	Branta Canadensis	B
Mallard	Anas platyrhynchos	E
Gadwall	A. strepera	E
Pintail	A. acuta	B
Green Winged Teal	A. carolinensis	E
Blue Winged Teal	A. discors	B
American Widgeon	Mareca americana	E
Shoveler	Spatula clypeata	B
Wood Duck	Aix sponsa	E
Redhead	Aythya americana	E
Ring-Necked Duck	A. collaris	E
Canvasback	A. valisineria	E
Lesser Scaup	A. affinis	B
Common Goldeneye	Bucephala clangula	E
Bufflehead	B. albeola	B
White-Winged Scooter	Melanitta deglandi	E
Surf Scoter	M. perspicillata	E
Ruddy Duck	Oxyura jamaicensis	E
Hooded Merganser	Lophodytes cucullatus	E
Common Merganser	Mergus merganser	B
Red-Breasted Merganser	M. serrator	B
Goshawk	Accipiter gentilis	E
Sharp-Shinned Hawk	A. striatus	E
Coopers Hawk	A. cooperii	E
Red-Tailed Hawk	Buteo jamaicensis	E
Broad-Winged Hawk	B. platypterus	E
Golden Eagle	Aquila chrysaetos	E
Bald Eagle	Haliaeetus leucocephalus	E
Marsh Hawk	Circus cyaneus	E
Osprey	Pandion haliaetus	E
Peregrine Falcon	Falco peregrinus	E
Pigeon Hawk	F. columbarius	E
Sparrow Hawk	F. sparverius	E
Spruce Grouse	Canachites canadensis	E
Ruffed Grouse	Bonasa umbellus	E
Willow ptarmigan	Lagopus lagopus	E
Rock Starling	L. mutus	E
Sharp-Tailed Grouse	Pedioecetes phasianellus	E
Gray Partridge	Perdix perdix	E
Sandhill Crane	Grus canadensis	E
Virginia Rail	Rallus limicola	E
Sora	Porzana carolina	E
Yellow Rail	Coturnicops noveboracensis	E
American Coot	Fulica americana	E
Semipalmated Plover	Charadrius semipalmatus	E

Appendix C

<u>Common Name</u>	<u>Generic Name</u>	<u>Range</u>
Piping Plover	<i>C. melodus</i>	+
Killdeer	<i>C. vociferus</i>	+
American Golden Plover	<i>Pluvialis dominica</i>	+
Common Snipe	<i>Capella gallinago</i>	+
Spotted Sandpiper	<i>Actitis macularia</i>	+
Solitary Sandpiper	<i>Tringa solitaria</i>	+
Greater Yellowlegs	<i>Totanus melanoleucus</i>	
Lesser Yellowlegs	<i>T. flavipes</i>	
Least Sandpiper	<i>Erolia minutilla</i>	
Short-Billed Dowitcher	<i>Limnodromus griseus</i>	3a
Martled Godwit	<i>Limosa fedoa</i>	T
Wilson's phalarope	<i>Steganopus tricolor</i>	14
Northern phalarope	<i>Lobipes lobatus</i>	T
Herring Gull	<i>Larus argentatus</i>	B
California Gull	<i>L. californicus</i>	T
Ring-Billed Gull	<i>L. delawarensis</i>	+
Franklin Gull	<i>L. pepixcan</i>	+
Bonaparte's Gull	<i>L. philadelphia</i>	+
Forrester's Tern	<i>Sterna forsteri</i>	+
Common Tern	<i>S. hirundo</i>	+
Caspian Tern	<i>Hydroprogne caspia</i>	+
Black Tern	<i>Chlidonias niger</i>	+
Mourning Dove	<i>Zenaidura macroura</i>	+
Great Horned Owl	<i>Bubo virginianus</i>	+
Hawk Owl	<i>Surnia ulula</i>	+
Barred Owl	<i>Strix varia</i>	+
Great Gray Owl	<i>S. nebulosa</i>	+
Long-Eared Owl	<i>Asio otus</i>	+
Short-Eared Owl	<i>A. flammeus</i>	+
Boreal Owl	<i>Aegolius funereus</i>	+
Saw-Whet Owl	<i>A. acadicus</i>	+
Common Nighthawk	<i>Chordeiles minor</i>	+
Chimney Swift	<i>Chaetura pelagica</i>	+
Ruby-Throated hummingbird	<i>Archilochus colubris</i>	+
Belted Kingfisher	<i>Megasceryle alcyon</i>	+
Yellow Shafted Flicker	<i>Colaptes auratus</i>	+
Red Shafted Flicker	<i>C. cafer</i>	+
Pileated Woodpecker	<i>Dryocopus pileatus</i>	+
Yellow-Bellied Sapsucker	<i>Sphyrapicus varius</i>	+
Hairy Woodpecker	<i>Dendrocopus</i>	+
Downy Woodpecker	<i>D. pubescens</i>	+
Black-Backed Three-Toed Woodpecker	<i>Picoides arcticus</i>	+
Northern Three-Toed Woodpecker	<i>P. tridactylus</i>	+
Eastern Kingbird	<i>Tyrannus tyrannus</i>	+
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	+
Eastern Phoebe	<i>Sayornis phoebe</i>	+
Yellow-Bellied Flycatcher	<i>Empidonax flaviventris</i>	+
Trail's Flycatcher	<i>E. traillii</i>	+
Least Flycatcher	<i>E. minimus</i>	+
Western Wood Pewee	<i>Contopus sordidulus</i>	+
Blue-headed Flycatcher	<i>Myiarchus borealis</i>	+
Horned Lark	<i>Eremophila alpestris</i>	+
Green Swallow	<i>Iridoprocne bicolor</i>	+
Bank Swallow	<i>Hirundo riparia</i>	+
House Swallow	<i>Hirundo rustica</i>	+
Clay-colored Swallow	<i>Petrochelidon pyrrhonota</i>	+
Purple Martin	<i>Ergaticus</i>	+

Appendix C

<u>Common Name</u>	<u>Generic Name</u>	<u>Count</u>
Gray Jay	<i>Perisoreus canadensis</i>	
Blue Jay	<i>Cynocitta cristata</i>	1
Black-Billed Magpie	<i>Pica pica</i>	1
Common Raven	<i>Corvus corax</i>	1
Common Crow	<i>C. brachyrhynchos</i>	1
Black-Capped Chickadee	<i>Parus atricapillus</i>	1
Boreal Chickadee	<i>P. hudsonicus</i>	1
White-Breasted Nuthatch	<i>Sitta carolinensis</i>	1
Red-Breasted Nuthatch	<i>S. canadensis</i>	1
Brown Creeper	<i>Certhia familiaris</i>	1
House Wren	<i>Troglodytes aedon</i>	1
Winter Wren	<i>T. troglodytes</i>	1
Long-Billed Marsh Wren	<i>T. palustris</i>	1
Short-Billed Marsh Wren	<i>Cistothorus platensis</i>	1
Cat Bird	<i>Dumetella carolinensis</i>	1
Brown Thrasher	<i>Toxostoma rufum</i>	1
American Robin	<i>Turdus migratorius</i>	1
Hermit Thrush	<i>Hylocichla guttata</i>	1
Swainson's (Russet-Backed) Thrush	<i>H. ustulata</i>	B
Gray-Cheeked Thrush	<i>H. minima</i>	T
Veery	<i>H. juscenscens</i>	T
Mountain Bluebird	<i>Sialia currucoides</i>	1
Golden-Crowned Kinglet	<i>Regulus satrapa</i>	7
Ruby-Crowned Kinglet	<i>R. calendula</i>	B
Sprague's Pipit	<i>Anthus spragueii</i>	4
Bohemian Waxwing	<i>Bombycilla garrulus</i>	2b
Cedar Waxwing	<i>B. cedrorum</i>	B
Northern Shrike	<i>Lanius excubitor</i>	B or W
Common Starling	<i>Sturnus vulgaris</i>	16
Solitary Vireo	<i>Vireo solitarius</i>	6
Red-Eyed Vireo	<i>V. olivaceus</i>	6
Philadelphia Vireo	<i>V. philadelphicus</i>	6
Warbling Vireo	<i>V. gilvus</i>	T
Black and White Warbler	<i>Mniotilta varia</i>	6
Tennessee Warbler	<i>Vermivora peregrina</i>	B
Orange-Crowned Warbler	<i>V. celata</i>	B
Nashville Warbler	<i>V. ruficapilla</i>	1
Yellow Warbler	<i>Dendroica petechia</i>	1
Magnolia Warbler	<i>D. magnolia</i>	1
Cape May Warbler	<i>D. tigrina</i>	1
Myrtle Warbler	<i>D. coronata</i>	1
Black-Throated Green Warbler	<i>D. virens</i>	1
Blackburnian Warbler	<i>C. fusca</i>	1
Chestnut-Sided Warbler	<i>D. pensylvanica</i>	1
Bay-Breasted Warbler	<i>D. castanea</i>	1
Blackpoll Warbler	<i>D. striata</i>	1
Palm Warbler	<i>D. palmarum</i>	1
Ovenbird	<i>Seiurus aurocapillus</i>	1
Northern Waterthrush	<i>S. noveboracensis</i>	1
Connecticut Warbler	<i>Oporornis agilis</i>	1
Mourning Warbler	<i>O. philadelphia</i>	1
Common Yellowthroat	<i>Geothlypis trichas</i>	1
Wilson's Warbler	<i>Wilsonia pusilla</i>	1
Canada Warbler	<i>W. canadensis</i>	1
American Redstart	<i>Setophaga ruticilla</i>	1
Western Meadowlark	<i>Sturnella neglecta</i>	1
Yellow-Headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	1
Red-Winged Blackbird	<i>Agelaius phoeniceus</i>	1
Baltimore Oriole	<i>Icterus galbula</i>	1
Rusty Blackbird	<i>Euphagus carolinus</i>	1
Brewer's Blackbird	<i>E. cyanocephalus</i>	1

Appendix C

<u>Common Name</u>	<u>Generic Name</u>	<u>Range</u>
Common Grackle	Quiscalus quiscula	
Brown-Headed Cowbird	Molothrus ater	
Red-Breasted Grebe	Pheucticus ludovicianus	a
Evening Grosbeak	Hesperiphona vespertina	
Purple Finch	Carpodacus purpureus	t
Pine Grosbeak	Pinicola enucleator	
Common Redpoll	Acanthis flammea	
Pine Siskin	Spinus pinus	
American Goldfinch	S. tristis	
Red Crossbill	Loxia curvirostra	5b
White-Winged Crossbill	L. leucoptera	B
Savannah Sparrow	Passerculus sandwichensis	B
Baird's Sparrow	Ammodramus bairdii	
LeConte's Sparrow	Passerherculus caudatus	
Sharp-Tailed Sparrow	Ammospiza caudata	
Vesper Sparrow	Poocetes gramineus	
Blue-Colored Junco	Junco hyemalis	
Tree Sparrow	Spizella arborea	
Chipping Sparrow	S. passerina	
Clay-Colored Sparrow	S. pallida	11
Harris Sparrow	Zonotrichia querula	
White-Crowned Sparrow	Z. leucophrys	
White-Throated Sparrow	Z. albicollis	
Fox Sparrow	Passerella iliaca	11
Lincoln's Sparrow	Melospiza lincolni	
Swamp Sparrow	M. georgiana	
Song Sparrow	M. melodia	
Lapland Longspur	Calcarius lapponicus	T
Smith's Longspur	C. pictus	T
Snow Bunting	Plectrophenax nivalis	W

Appendix D

List of Freshwater Fishes Known or Thought to Occur in the
Mid North Planning Zone

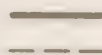
Common Name	Generic Name	Occurrence ^a
Silver Lamprey	<i>Ichthyomyzon unicuspis</i>	5U, 5S, 4K
Lake Sturgeon	<i>Acipenser fulvescens</i>	All except 6D
Rainbow Trout	<i>Salmo gairdneri</i>	5L, 5K, 5U
Brook Trout	<i>Salvelinus fontinalis</i>	Eastern Portions of 5U and 6F
Lake Trout	<i>S. nomaycush</i>	B
Lake Herring (Cisco)	<i>Coregonus artedii</i>	B ^b
Shortjaw Cisco	<i>C. zenithicus</i>	6D, 5S
Blackfin Cisco	<i>C. nigripinnis</i>	6D, 5S
Lake Whitefish	<i>C. clupeaformis</i>	B
Arctic Grayling	<i>Thymallus arcticus</i>	All 6
Goldeye	<i>Hiodon alosoides</i>	5K, 5L, 5U, 5T, 4A, 5S
Mooneye	<i>H. tergisus</i>	5L, 5K, 5U, 5S, 5R
Northern Pike	<i>Esox lucius</i>	B
Lake Chub	<i>Couesius plumbeus</i>	B
Carp	<i>Cyprinus carpio</i>	5S, 5U, 5L, 5K
Golden Shiner	<i>Notemigonus crysoleucas</i>	5L, 5K, 5U, 5S, 5R
Emerald Shiner	<i>Notropis atherinoides</i>	6D, 6E, All 5, All 4
River Shiner	<i>N. blennius</i>	5L, 5K, 5U, 5S, 5R
Mimic Shiner	<i>N. volucellus</i>	5L
Blacknose Shiner	<i>N. heterolepis</i>	5K, 5L, 5U, 4A, 5S, 5R
Spottail Shiner	<i>N. hudsonius</i>	B
Fathead Minnow	<i>Pimephales promelas</i>	5K, 5L, 5U, 4A, 5S, 5R
Fathead Chub	<i>Platygobio gracilis</i>	5L, 5K, 5U, 5S, 5R
Blacknose Dace	<i>Rhinichthys atratulus</i>	5L, 5K, 5U, 5S, 5R
Longnose Dace	<i>R. cataractae</i>	All 5, All 4
Cheek Chub	<i>Semotilus atromaculatus</i>	5S, 5R
Pearl Dace	<i>S. margarita</i>	B
Quillback	<i>Carpiodes cyprinus</i>	5L, 5K, 5U, 5S, 5R
Longnose Sucker	<i>Catostomus catostomus</i>	B
White Sucker	<i>C. commersoni</i>	B
Silver Redhorse	<i>Moxostoma anisurum</i>	5L, 5K, 5U, 5S
Shorthead Redhorse	<i>M. macrolepidotum</i>	All 5, All 4
Burbot	<i>Lota lota</i>	B
Brook Stickleback	<i>Culaea inconstans</i>	All except 6D
Ninespine Stickleback	<i>Pungitius pungitius</i>	B
Threespine Stickleback	<i>Gasterosteus aculeatus</i>	6F, 6G
Trout-Perch	<i>Percopsis omiscomaycus</i>	B
Yellow Perch	<i>Perca flavescens</i>	B
Sauger	<i>Stizostedion canadense</i>	5K, 5L, 5U, 4A, 5S, 5R
Walleye	<i>S. vitreum</i>	B
Iowa Darter	<i>Etheostoma exile</i>	5K, 5L, 5U, 5S, 5R
Johnny Darter	<i>E. nigrum</i>	B
Log Perch	<i>Percina caprodes</i>	All except 6D
Blackside Darter	<i>P. maculata</i>	5L, 5K,
River Darter	<i>P. shumardi</i>	5L, 5K, 5S, 5U, 5R
Freshwater Drum	<i>Aplodinotus grunniens</i>	5L, 5K, 5S, 5U
Mottled Sculpin	<i>Cottus bairdi</i>	5L, 5K, 5U, 5S, 5R
Slimy Sculpin	<i>C. cognatus</i>	B
Spoonhead Sculpin	<i>C. ricei</i>	6D, 6E, All 5, All 4
Deepwater Sculpin	<i>Myoxocephalus quadricornis</i>	6D, 6E

Source: Scott and Crossman, 1973

^aOccurrence: numbers refer to watershed drainage divisions shown on accompanying map^bindicates species is found in its natural habitat throughout the zone



DRAINAGE BASINS
MAIN DRAINAGE DIVISION
SUBDIVISION



MAP 1.
APPENDIX D

MID NORTH
PLANNING ZONE

1 inch: 40 miles

Appendix E

Mammals of the Mid North Planning Zone^a

Common Name	Generic Name	Occurrence
Masked Shrew	<i>Sorex cinereus cinereus</i>	B
Water Shrew	<i>S. palustris palustris</i>	B
Arctic Shrew	<i>S. arcticus arcticus</i>	B
Northern Pygmy Shrew	<i>Microsorex hoyi intervectus</i>	B
Short-Tailed Shrew	<i>Blarina brevicauda manitobensis</i>	*
Star-Nosed Mole	<i>Condylura cristata cristata</i>	*
Little Brown Bat	<i>Myotis lucifugus lucifugus</i>	B
Silver-Haired Bat	<i>Lasionycteris noctivagans</i>	*
Red Bat	<i>Lasiurus borealis borealis</i>	*
Hoary Bat	<i>Lasiurus cinereus cinereus</i>	B
Snowshoe Hare	<i>Lepus americanus americanus</i>	B
Little Northern Chipmunk	<i>Eutamias minimus borealis</i>	B
Hudson Bay Chipmunk	<i>E. minimus hudsonius</i>	*
Lake Superior Chipmunk	<i>E. m. jacksoni</i>	*
Woodchuck	<i>Marmota monax canadensis</i>	B
Northern Striped Ground Squirrel	<i>Spermophilus tridecemlineatus Hoodii</i>	*
Red Squirrel	<i>Tamiasciurus hudsonicus hudsonicus</i>	B
Northern Flying Squirrel	<i>Glaucomys sabrinus sabrinus</i>	*
Beaver	<i>Castor canadensis canadensis</i>	B
Deer Mouse	<i>Peromyscus maniculatus borealis</i>	*
Deer Mouse	<i>P.m. maniculatus</i>	*
Gapper's Red-Backed Vole	<i>Clethrionomys gapperi hudsonius</i>	*
Athabaska Red-Backed Vole	<i>C. g. athabascae</i>	*
Heather Vole	<i>Phenacomys intermedius mackenzii</i>	*
Heather Vole	<i>P. i. soperi</i>	*
Meadow Vole	<i>Microtus pennsylvanicus drummondii</i>	B
Yellow Checked Vole	<i>M. xanthognathus</i>	*
Northern bog Lemming	<i>Synaptomys borealis smithi</i>	B
Hudson Bay Jumping Mouse	<i>Zapus hudsonius hudsonius</i>	B
Muskrat	<i>Ondatra zibethicus albus</i>	B
Porcupine	<i>Erethizon dorsatum dorsatum</i>	B
Coyote	<i>Canis latrans thomomys</i>	*
Saskatchewan Timber Wolf	<i>Canis lupus griseoalbus</i>	B
Timber Wolf	<i>C.l. hudsonicus</i>	*
Arctic Fox	<i>Alopex lagopus innuitus</i>	B
Red Fox	<i>Vulpes fulva regalis</i>	B
Black Bear	<i>Ursus americanus americanus</i>	B
Raccoon	<i>Procyon lotor hirtus</i>	*
Martin	<i>Martes americana actiosa</i>	*
Martin	<i>M.a. americana</i>	*
Fisher	<i>M. pennanti columbiana</i>	*
Fisher	<i>M. p. pennanti</i>	*
Ermine (Richardson Weasel)	<i>Mustela erminea richardsonii</i>	B
Least Weasel	<i>M. nivalis rixosa</i>	B
Mink	<i>M. vison locustris</i>	B
Wolverine	<i>Gulo gulo luscus</i>	B
Striped Skunk	<i>Mephitis mephitis hudsonica</i>	*
River Otter	<i>Lutra canadensis preblei</i>	B
Lynx	<i>Lynx canadensis canadensis</i>	B
Mule Deer	<i>Dama hemionus</i>	*
White-Tailed Deer	<i>D. virginiana dacotensis</i>	*
Moose	<i>Alces alces andersoni</i>	B
Woodland Caribou	<i>Rangifer tarandus caribou</i>	*
Barren Ground Caribou	<i>R. arcticus arcticus</i>	*

Source: Seton (1909), Hall and Kelso (1959), Soper (1961), De Jong (1970), Weir (1961), Banfield (1974).

^a Mammals known to or thought to normally occur within the zone.

B: species found throughout the Planning Zone

* species which occur in a portion of the Planning Zone

Table 1
Appendix F
Average Trapper Income¹
(Dollars)

RTL	1975/6	1976/7
Brochet	676.62	1250.53
Cormorant	556.44	1002.99
Cranberry	1371.31	1475.24
Cross Lake	378.67	465.42
Easterville	?	271.13
Flin Flon	1037.85	1270.48
Grand Rapids	?	524.24
Herb Lake	733.48	1231.22
Moose Lake	1010.48	834.71
Nelson House	720.55	711.26
Norway House	833.35	666.87
Pikwitonei	1458.63	1892.50
Pukatawagan	785.28	1005.13
Red Deer/Shoal River	1028.17	1012.14
Sherridon	771.91	829.20
Southern Indian Lake	564.72	745.59
Split Lake	711.38	1048.92
Thicket Portage	1229.95	1365.26
Summerberry Fur Block ²	1042.30	650.71
Wabowden	884.12	1076.19
Mean	877.51	966.49

¹ Average income determined by dividing the estimated gross value of the RTL using average auction values divided by total licences issued.

² Includes The Pas open area.

? Number of trappers unknown.

Table 2
Appendix F

Average Fur Prices^a (Dollars)

	Bear	Beaver	Coyote	Fisher	Red Fox	Cross Fox	Lynx	Marten	Mink	Muskrat	Otter	Squirrel	Timber Wolf	Ermine	Wolverine	Mean
1976/7	36.64	21.42	58.13	88.38	56.98	95.77	241.72	20.99	23.57	4.27	59.79	.80	78.31	1.37	169.39	63.84
1975/6	65.00	20.00	56.00	97.00	43.00	85.00	257.00	24.00	26.00	3.62	60.00	.70	101.00	.90	159.00	65.23
1974/5	29.97	15.34	36.91	45.38	30.87	48.06	123.01	15.34	13.13	2.62	36.35	.63	62.22	.80	94.88	36.25
1973/4	50.55	19.50	38.90	43.25	39.20	67.00	90.00	16.60	22.00	2.80	37.65	.75	63.72	1.20	78.50	36.04
1972/3	74.19	20.05	28.98	33.13	29.40	43.93	90.15	8.66	23.40	2.64	39.68	.50	53.08	1.03	83.80	34.91
1971/2	25.00	18.18	14.82	27.34	15.15	19.98	39.31	8.64	19.32	2.01	37.62	.52	37.68	.74	84.65	23.63
1970/1	35.00	14.09	12.15	31.20	12.40	21.90	29.50	8.15	11.20	1.57	31.50	.25	23.00	.52	70.40	20.07
1969/70	33.00	19.00	13.00	23.00	10.00	18.00	30.00	10.00	13.00	1.45	33.00	.25	38.00	.98	57.00	20.12
1968/9	26.50	22.00	15.25	20.50	14.50	16.50	41.00	9.75	17.00	1.55	32.50	.40	27.00	2.43	52.50	20.21
1967/8	18.66	18.00	8.25	12.33	8.05	9.83	32.66	7.66	16.00	1.01	19.00	.51	16.66	1.48	26.00	13.31

Source: R. Stardom, Research Branch, Department R.R.T.S.

^aF.O.B. Winnipeg auction

Appendix F

Table 3

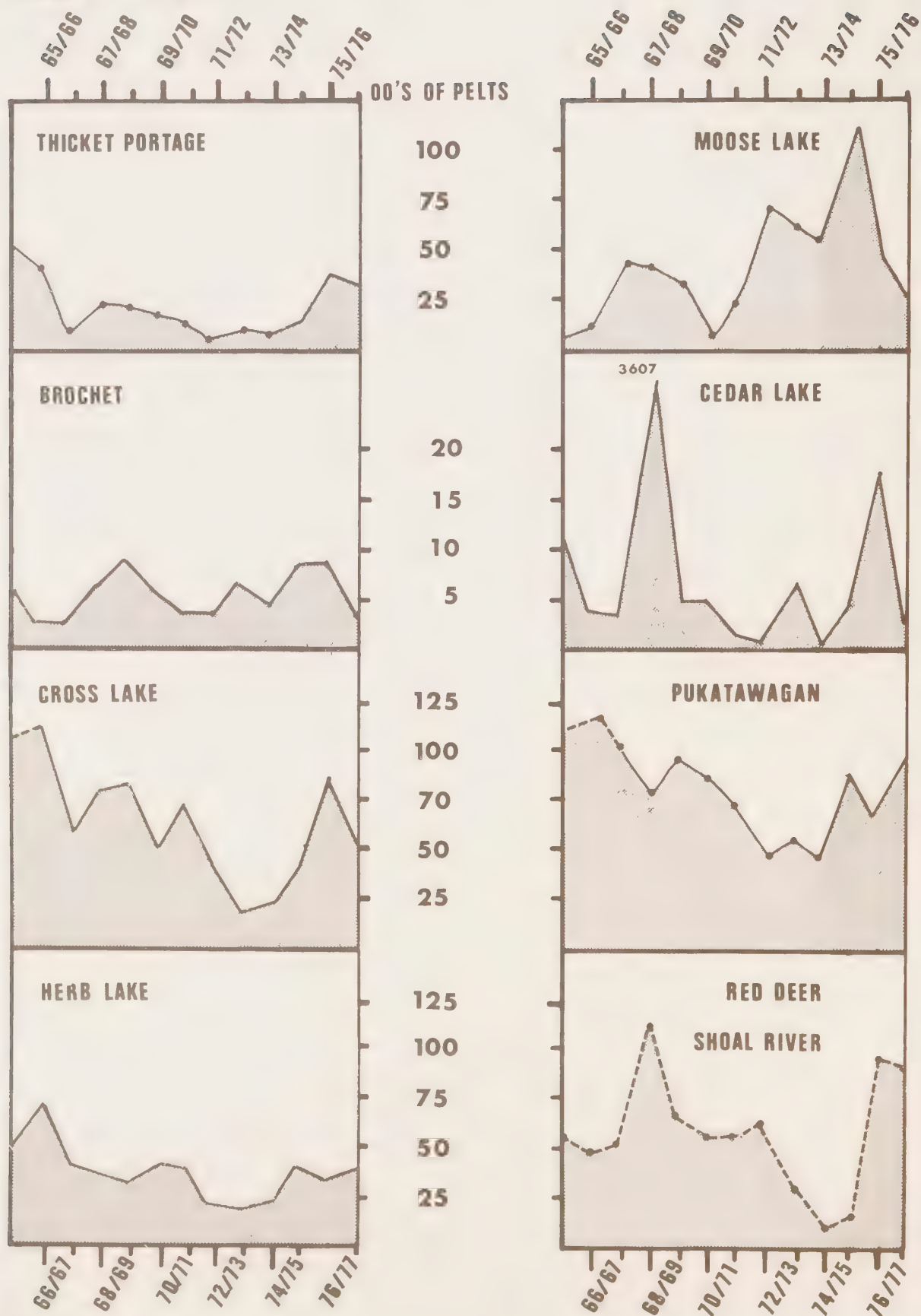
Mid North Trappers Income Breakdown^a

Season	Total Trappers	Over \$2000 ^b Number	%	Under \$500 Number	%
1976/7	1251	148	11.8	656	52.4
1975/6	1113	100	9.0	626	56.2
1974/5	1036	21	2.0	749	72.3
1973/4	1013	34	3.4	715	70.6
1972/3	994	54	5.4	605	60.9
Mean	1081	71	6.6	670	62.0

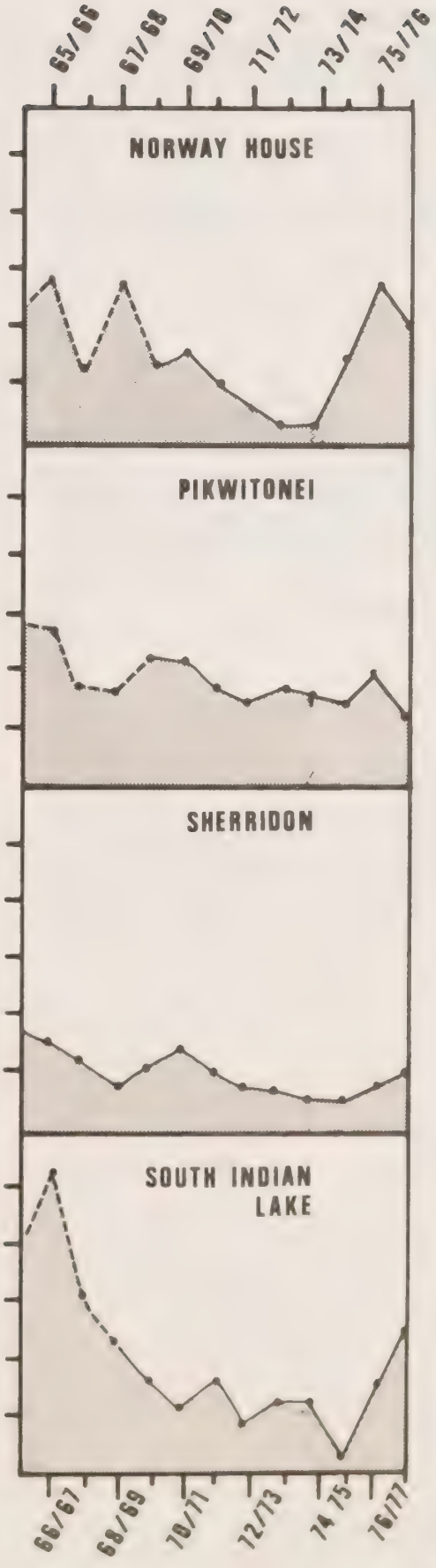
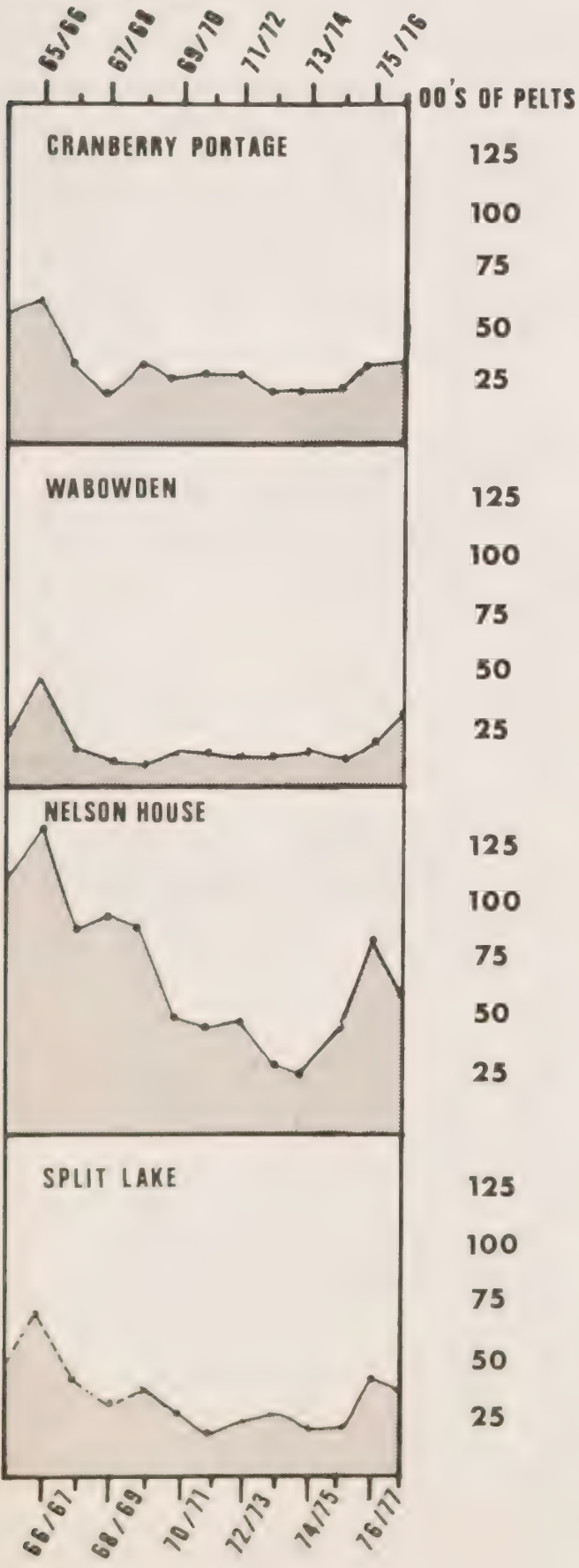
^aAll RTL's within the Mid North are included in their entirety when individual breakdowns are available.

^bValues used are average prices F.O.B. Winnipeg auction.

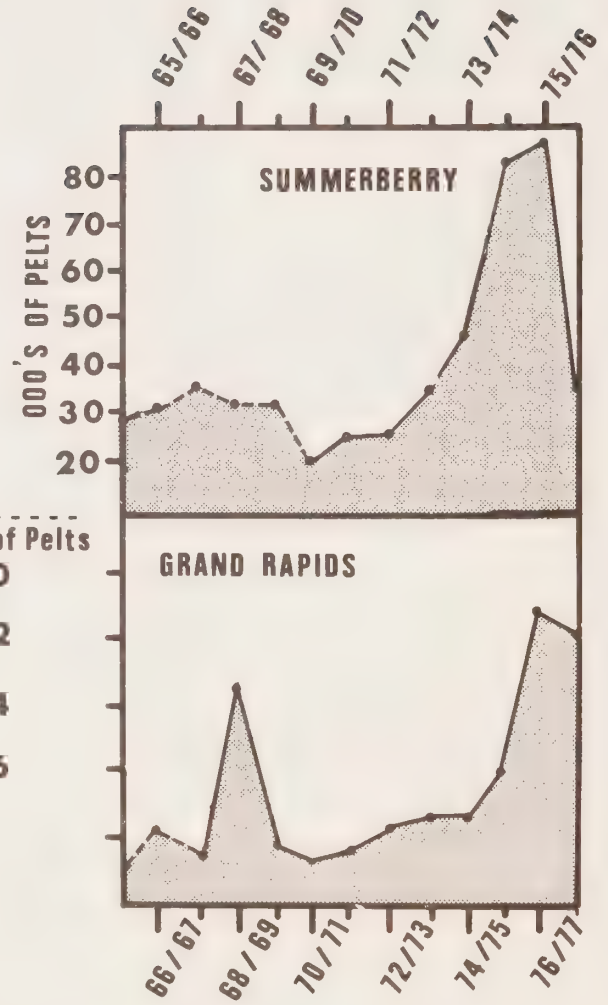
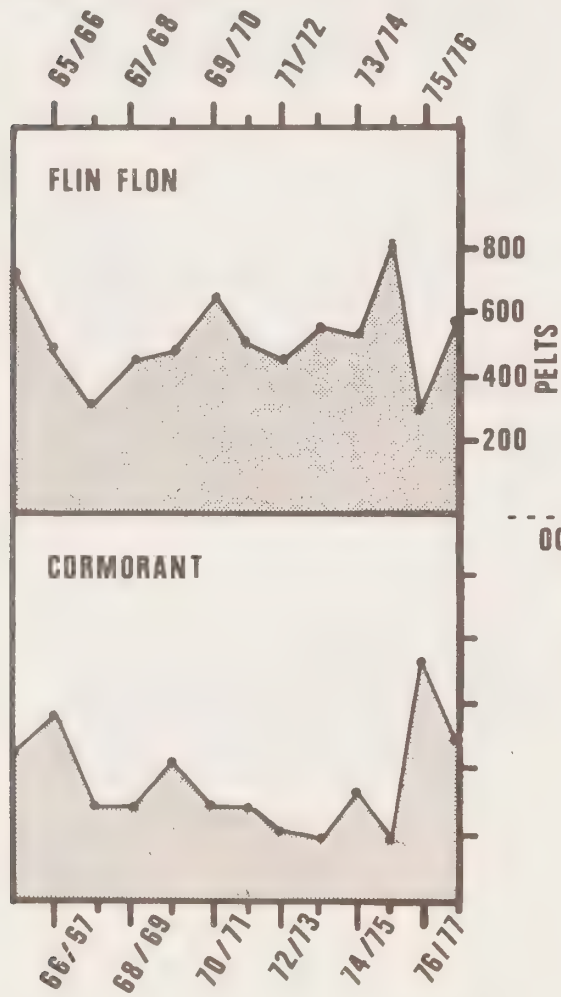
APPENDIX F
SECTION FUR HARVEST
1964/65 - 1976/77



APPENDIX F
SECTION FUR HARVEST
1964/65-1976/77



APPENDIX F
SECTION FUR HARVEST
1964/65-1976/77



Appendix G

Commercial Fishing Quotas^a (in thousands of pounds)

Lakes		Lakes		Lakes	
Abram	5 SW	Gauer	60 SW	Partridge Breast	20 SW
Allen	25 SW	Gestur	10 SW	Partridge Crop	30 SW
Angie	5 SW	Girouard	15 W	Pearson	5 SW
Anson etc.	10 SW	Goose	50 W	Pearson	20 SW
Apeganau	15 SW	Granville	200 SW	Pelletier	20 SW
Armstrong	20 SW	Guthrie	25 SW	Pemichigamau	10 SW
Assean	40 SW	Halfway	30 SW	Pikwitonei	15 SW
Baldock	80 SW	Hall	5 SW	Pipestone	30 SW
Barnes	10 SW	Handle	10 SW	Playgreen	300 SW
Barrington	55 SW	Harding	20 SW	Porcupine	5 SW
Batty	10 SW	Herblett	20 SW	Rat (West)	45 SW
B.C. etc.	5 W	Holmes	45 SW	Recluse	5 SW
Beau Cage	5 SW	Hunter	10 SW	Reed	15 W
Begg (North)	5 SW	Isbister	5 SW	Reindeer	650 SW
Bissett	10 SW	Jensen	5 SW	Roe	5 SW
Black Trout etc.	20 SW	Jordan	30 SW	Runner	5 SW
Bluenose	5 SW	Kamuchawie	20 SW	Running Bear	5 SW
Brannigan	10 SW	Kettle	10 SW	Russell etc.	75 SW
Bright	5 SW	Kiask	5 SW	Russick	5 SW
Britton	10 SW	Kipahigan	50 SW	Rusty	10 SW
Bruneau	10 SW	Kiski	10 SW	Sabomin	10 SW
Brunne etc.	10 W	Kiskitto	30 SW	Saskatchewan River	100 S 50 W
Buckingham	5 SW	Kiskittogisu	50 SW	Setting	50 SW
Bud	5 SW	Kisseynew	35 SW	Simpson etc.	5 SW
Burntwood	70 SW	Kississing	50 SW	Sipiwesk	100 SW
Butterfly	15 SW	Landing	45 SW	Sisipuk	100 SW
Caldwell	25 SW	Landry	15 SW	Snake	15 SW
Caribou	5 SW	Laurie	25 SW	Solomon	5 SW
Cedar	500 SW	Leftrook	30 SW	Southern Indian	800 S 400 W
Chapman etc.	20 SW	Limestone	25 SW	Split	100 SW
Christie	15 SW	Limestone Point	20 SW	Stag	10 SW
Chuiпка	10 SW	Little Limestone	20 SW	Story	5 SW
Clearwater etc.	20 SW	Loon	15 SW	Summerberry Gp.	75 SW
Cockeram	10 W	Loon River	10 SW	Suwannee	30 SW
Cormorant	20 SW	Loonhead	10 SW	Tait	5 SW
Costello	10 SW	Lundy	5 SW	Takipy etc.	10 SW
Cousins	10 SW	MacBride	5 SW	Talbot	50 SW
Craig	5 SW	McLarty	15 SW	Thorsteinson	30 SW
Cross	100 SW	McKnight	35 SW	Three Finger	5 SW
Crow	5 SW	McLeod	10 SW	Tod	15 SW
Dolomite	5 W	Mackie etc.	30 SW	Trophy	5 SW
Dow	5 SW	Matheson Group	20 SW	Trout (South)	10 SW
Drunken	10 SW	Melvin	20 SW	Uhlman	20 SW
Duck	30 SW	Mistake	5 SW	Walker	85 SW
Dugas	10 SW	Moody	5 SW	Walton	5 SW
Dunphy	30 SW	Moose	10 SW	Wapisu	30 SW
Dunsheath	15 SW	Moose (North arm)	75 SW	Wasekwan	5 SW
Dyce	5 SW	(East arm)	75 SW	Waskauiowaka	50 SW
Eden	40 SW	(Pick ch.)	400 SW	Wedge	5 W
Eirnason	10 SW	Moose Nose	10 SW	Wekusko	125 W
Election	5 W	Morin	15 SW	Wernham	10 SW
Elephant	5 SW	Moss	10 SW	White Cap	10 SW
Elvyn etc.	10 SW	Mynarski	25 SW	White Rabbit	10 SW
Enatik	10 SW	Naosap etc.	20 W	White Stone	30 SW
Farwell	10 SW	Natawahunan	30 SW	William	100 SW
Fay etc.	5 SW	Nelson River	25 SW	Wintering	50 SW
File	15 SW	Notigl	10 SW	Witchai	20 SW
Finch	5 SW	Numakoos	5 SW	Wood	15 SW
Fish	5 S	Opachuanau	50 SW	Woosey etc.	15 SW
Flatrock etc.	175 SW	Orr	25 SW	Wuskwatim	40 SW
Florence	10 SW	Paint	15 W	Yawningstone	10 SW
Fraser	15 SW	Pakwa	30 SW	Hjalmarson	40 SW

^a Round weight quota as listed in Canada Gazette

S - Summer Season

W - Winter Season

SW - Combined summer and winter quota or annual quota

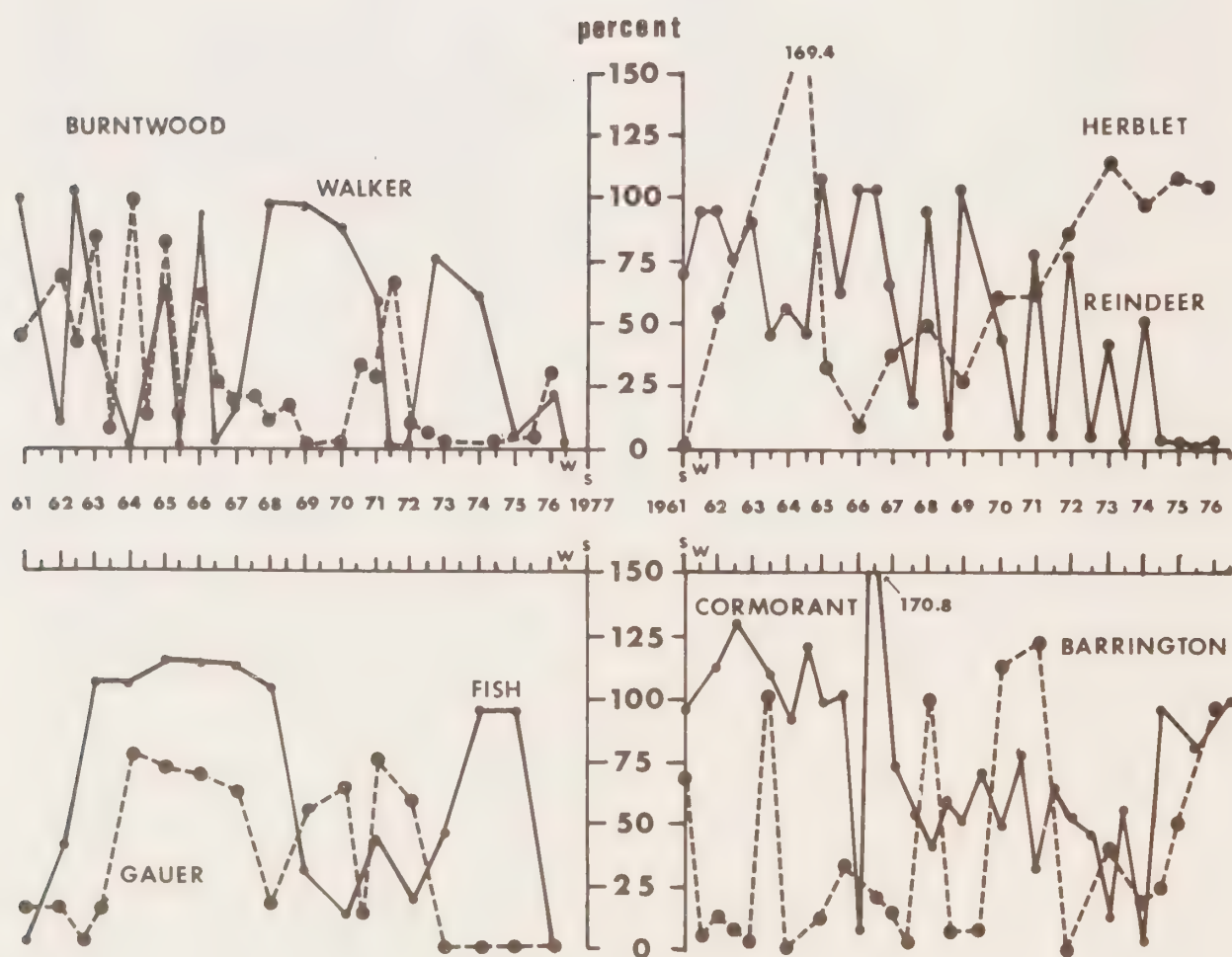
APPENDIX G.

PERCENT QUOTA FILLED OF SELECTED MID NORTH LAKES

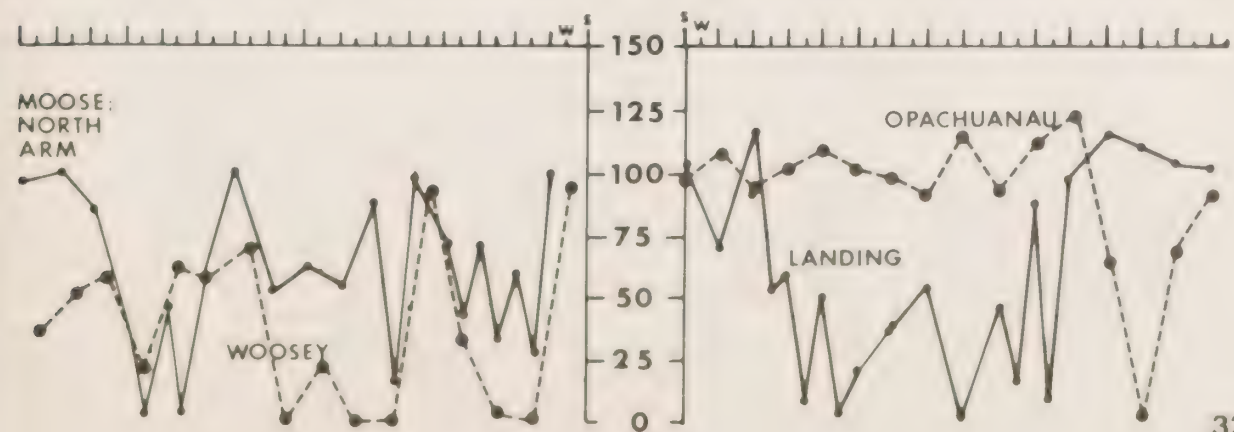
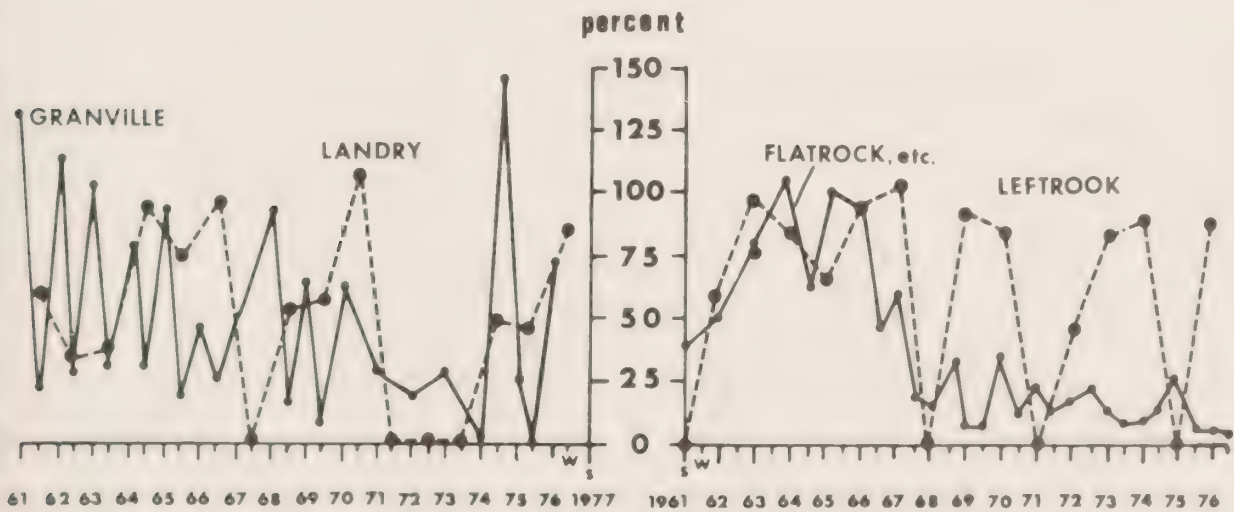
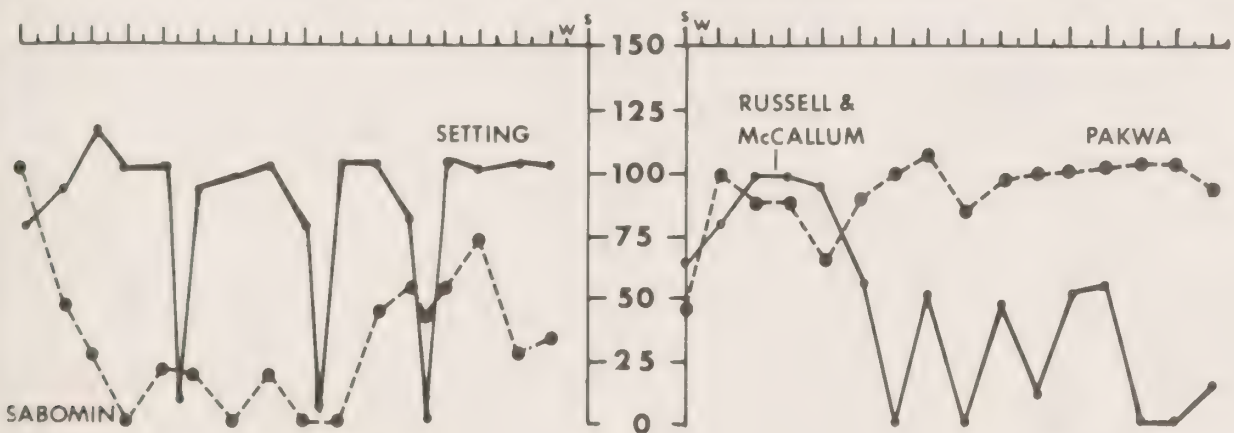
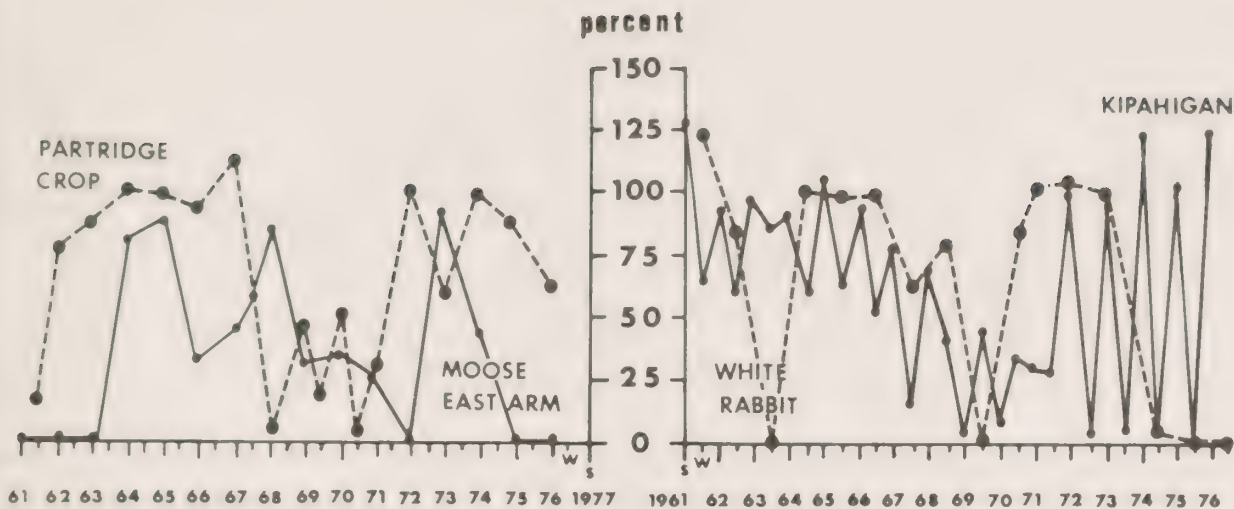
S - Summer Season

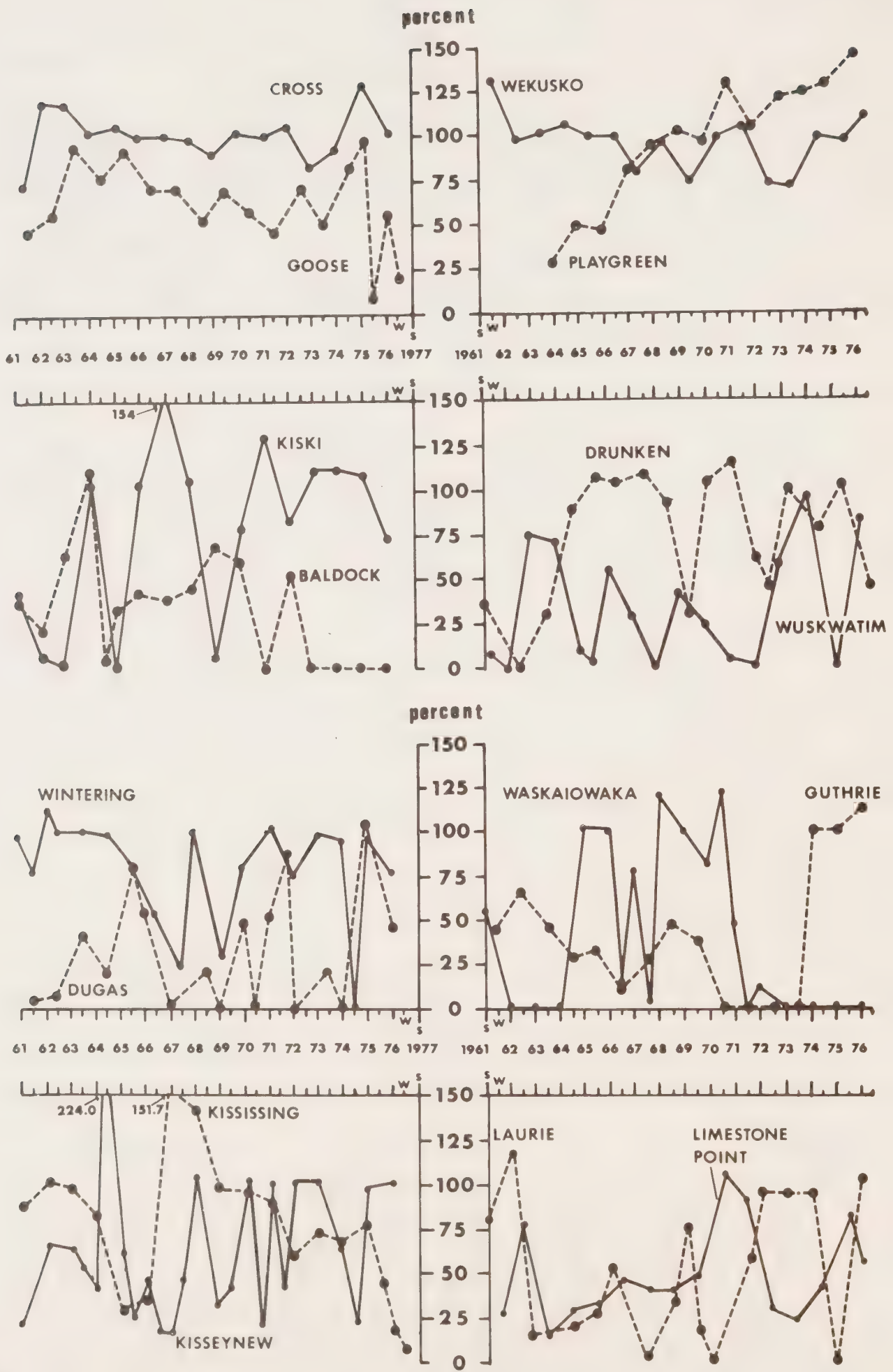
W - Winter Season

Note: additional numbers are percentages for seasons over 150.

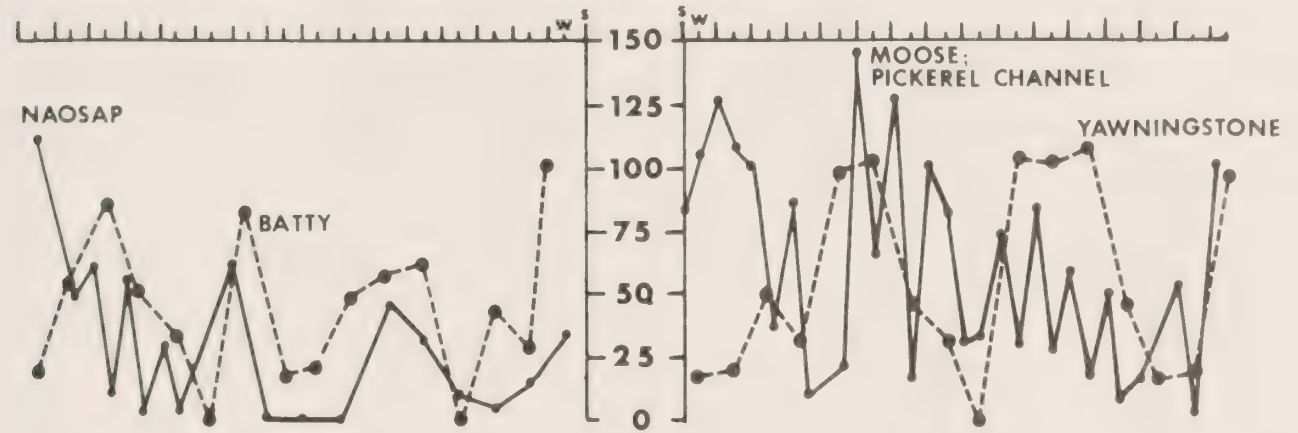
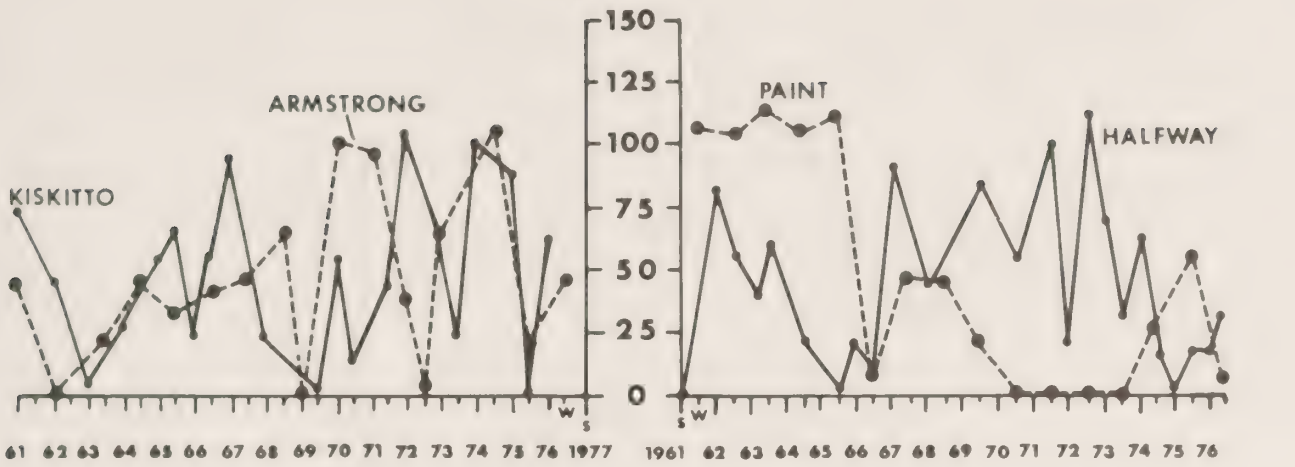


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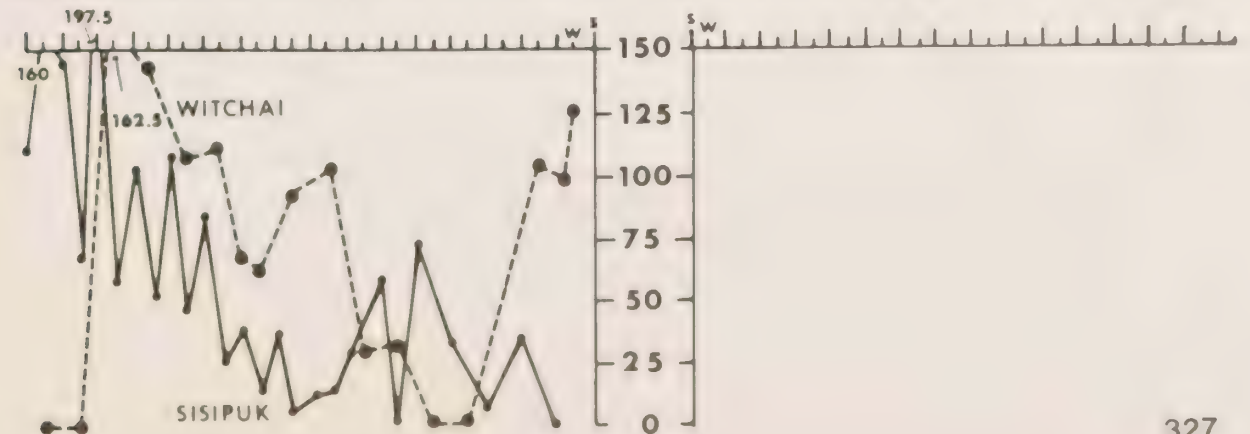
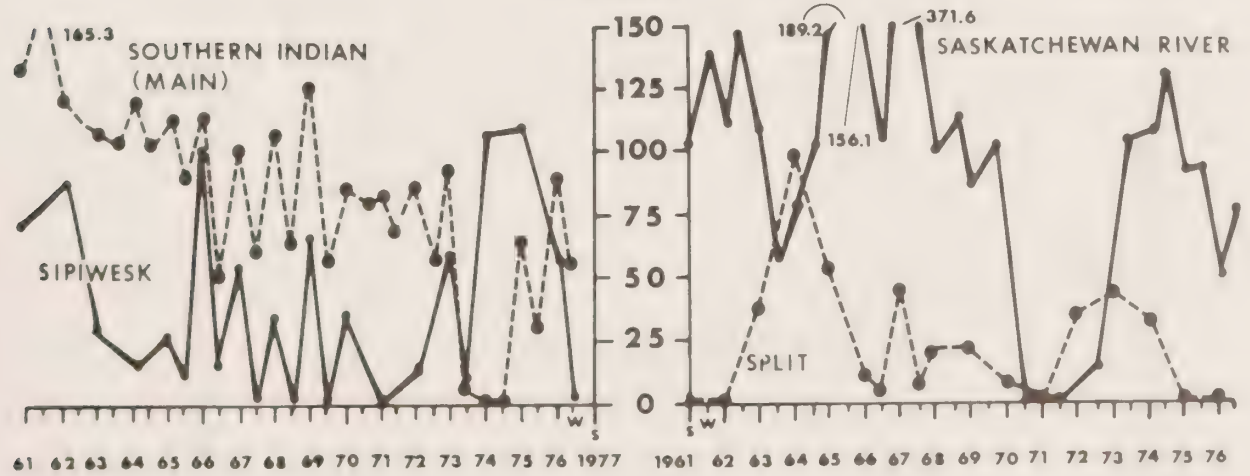




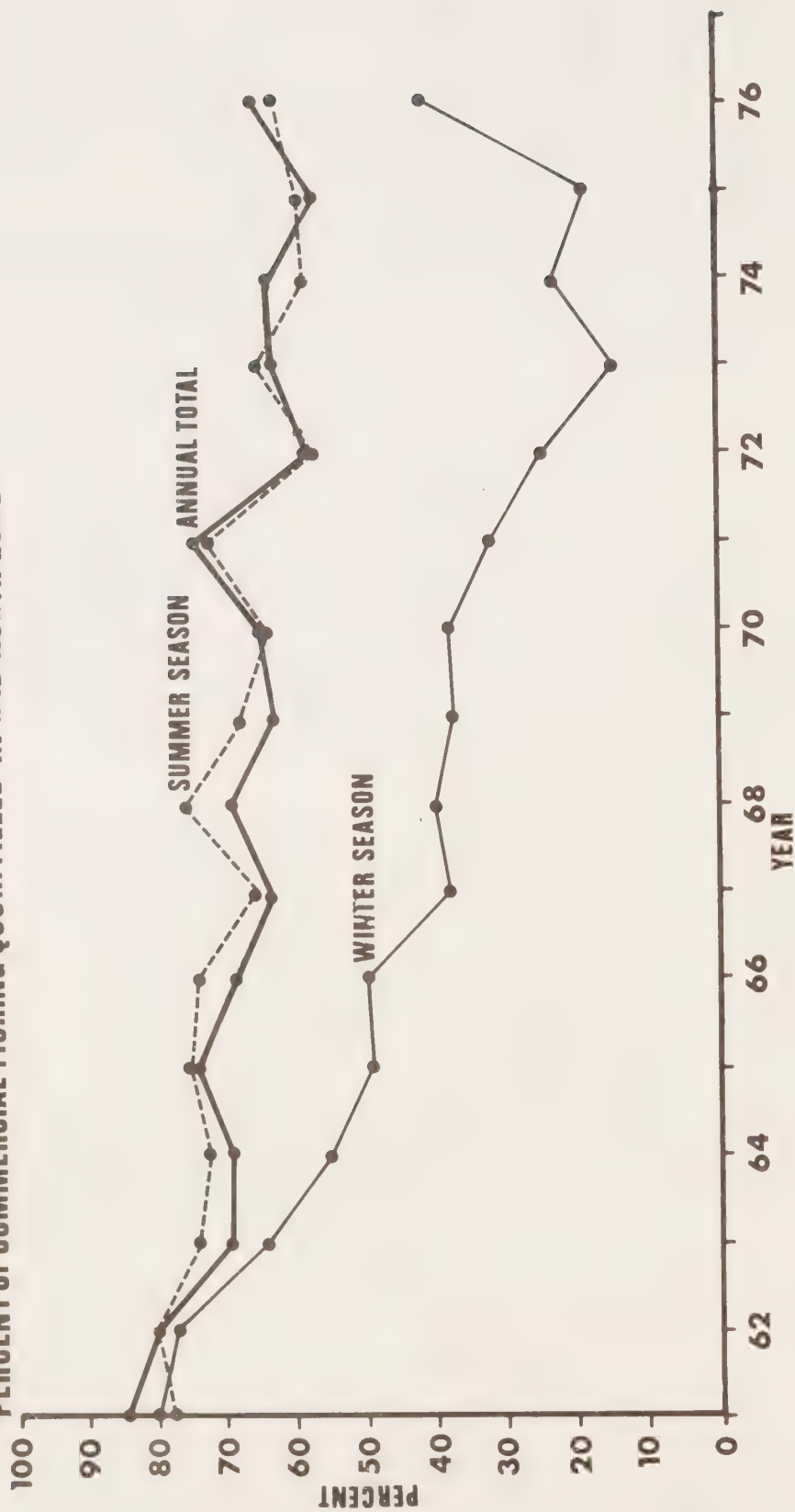
percent



percent



APPENDIX 6
PERCENT OF COMMERCIAL FISHING QUOTA FILLED IN MID NORTH ZONE^a



^a.QUOTA ONLY FOR THOSE LAKES FISHED

Appendix H

Methodology for Estimating Forest Capability

The methodology developed to estimate the capability of land to produce wood fiber was first used in the East Lake Winnipeg Interim Land Use Plan.¹ It involves the use of mean annual increment per township (MAI/TWP) and mean annual increment per acre of productive forest land per township (MAI/ acre of productive forest land/TWP).

The value of MAI/TWP evaluates the total township in terms of productivity while the MAI/acre of productive forest land/TWP assesses the productivity of the productive forest land within the township. The combination of these 2 factors yield an estimate of the relative capability of these townships to produce wood fiber. The following matrix was used to determine the range of capabilities.

		<u>MAI/Acre of Productive Forest Land/TWP</u>			
		Acres			
		31+	21-30	11-20	-10
<u>MAI/TWP</u>	400+	VH	VH	H	M
	250-400	VH	H	M	M
	100-250	H	M	M	L
	-100	L	L	L	L
VH - Very High		M - Medium			
H - High		L - Low			

The matrix yields the following ranges.

¹East Lake Winnipeg Interim Land Use Plan, Planning Division, Department of Mines, Resources and Environmental Management, (April, 1974) and subsequently used in the North East Planning Zone Information Package.

Appendix H

Forest Capability Ranges

MAI/TWP		MAI/Acre of Productive Forest Land/TWP
Very High (VH)	400+	31+
	400+	21-30
	250-400	31+
High (H)	400+	11-20
	250-400	21-30
	100-250	31+
Medium (M)	400+	-10
	250-400	11-20
	250-400	-10
	100-250	21-30
	100-25-	11-20
Low (L)	100-250	-10
	-100	31+
	-100	21-30
	-100	11-20
	-100	-10

Table 1

Appendix I

Data Licence Discrepancies Wabowden Fishery^a

Season	Total ^b Licences	Unlicenced ^c Producers	Percent Unlicenced Producers
S73	60	6	10.0
W73/4	35	7	20.0
S74	72	7	9.7
W74/5	34	1	2.9
S75	88	18	20.5
W75/6	38	3	7.9
S76	84	14	16.7
W76/7	40	1	2.5
Total	451	57	
Mean	56	7	12.5

Source: Modified from Wabowden Technical Information Report MS 77-32

^aWabowden Fishery is considered to include all lakes fished by Wabowden residents

^bTotal licences are the total of all commercial fishermen and commercial operator licences for each lake.

^cMen shown to have produced fish (and paid for) by F.F.M.C. files but are not shown as holding licences on that particular lake by department files

Table 2

Appendix I

Data Production Discrepancies^a

Fishing Seasons (in % Difference)

Lake	S73	W73/4	S74	W74/5	S75	W75/6	S76	W76/7
Bruneau	0	-	+27	?	- 1.4	-	- 6.7	-
Duck	-214.3	-	- 1.1	-	+ 0.5	-	- 2.4	-
Fish	+ 10.8	?	- 2.2	-	*	-	-	-
Halfway	0	- 7.3	+ 0.2	+ 5.1	0	- 6.4	*	0
Kiski	- 6.0	-	+ 0.2	-	0	-	0	-
Kiskitto	- 9.2	*	- 3.0	-	- 1.6	-	*	-
Kiskittogisu	+ 2.8	-	- 1.7	-	+ 1.0	-	- 0.2	-
Pakwa	*	-	+ 0.9	-	-14.1	-	- 0.6	-
Setting	*	-	- 0.6	-	- 2.5	-	- 0.2	-
Sipiwesk	+ 12.3	-24.1	- 1.6	-	- 1.7	-	- 8.9	0
Utik	*	-	+ 0.1	-	?	+17.9	- 2.8	-
White Rabbit	?	-	-	0	-	-	-	-
Drunken	-	*	-	+ 1.9	?	+ 3.6	-	+8.1
Apeganau	-	-	-	-	-	-	- 0.3	-
Hermon	-	+18.8	?	-	-	-	-	-
Tullibee	-	?	-	-	-	0	-	-
Nelson River	-	-	-14.9	-	-32.0	-	-14.8	-
Butterfly	-	-	-	0	-	-13.9	- 5.5	-
Lawford	-	-	-	0	-	?	-	-
Solomon	-	-	-	0	-	-	?	0
Witchai	-	-	-	?	-	?	-	*
Bowden	-	-	-	-	-	-	+ 9.7	-

Source: Modified from Wabowden Technical Information Report MS 77-32.^a Discrepancies between F.F.M.C. production figures and M.N.R.E. production figures.

- Not fished

* Less than .1%

0 No difference

? F.F.M.C. production no M.N.R.E. production

Appendix J

Table 1

Waterfowl Harvest North of 53°
Manitoba

	1972	1973	1974	1975	1976
Duck	28,781	61,344	63,101	93,166	107,684
Canada Geese	4,485	9,498	15,853	27,943	27,374*
Other Geese	2,048	1,990	4,774	5,515	--
Coot	288	811	1,306	1,551	277
Total Waterfowl	35,602	73,643	85,034	128,175	135,335

*Includes Other Geese

Source: Canadian Wildlife Service, Notes 51, 52, 68, 70, 81, 83

Appendix J

Table 2

Migratory Game Birds^a Hunting Statistics
(,000 of User Days)

	1969	1970	1971	1972	1973	1974	1975	1976
Area 01	6.3	2.7	2.7	13.5	9.1	23.2	12.9	14.9
Area 02	.3	.1	.4	1.0	2.7	3.7	5.8	6.4

Source: Canadian Wildlife Service. Progress Notes

^aOther than ducks and geese e.g., cranes, coots, etc.

Appendix J

Table 3

Hunting^e Waterfowl Statistics

	1968	1969	1970	1971	1972	1973	1974	1975	1976
Resident ^a permits	38,712	39,009	36,553	37,754	39,190	39,051	35,118	40,258	42,766
Non-Resident ^b	n.a.	2,170	2,318	2,665	1,943	2,643	2,049	2,588	3,915
Area 02 ^c sales	n.a.	3,323	3,418	3,396	3,128	3,270	3,252	7,580	8,326
Percent active hunters (02)	n.a.	74.0	71.2	79.8	89.8	87.3	86.3	83.4	88.5
User days (01) ^d	176,254	226,412	226,903	163,353	222,662	192,657	190,326	221,865	218,052
User days (02)	15,674	15,673	15,263	47,266	20,482	52,752	58,062	77,838	83,916

Source: Canadian Wildlife Service Progress Notes 10, 16, 22, 28, 34, 41, 51, 52, 68, 70, 81, 83

^a Resident in defined as any Canadian citizen

^b Migratory game bird permits sold in Manitoba

^c Manitoba north of 53°N. lat.

^d (1) is the area in Manitoba south of 53°N. lat.

^e Includes ducks and geese

^f Sold in Manitoba

n.a. not available

Appendix J

Table 4

Caribou Hunting

	1970	1971	1972	1973	1974	1975	1976	1977
Licences Available	u	u	225	225	200	250	200	115
Licences Sold	u	u	u	u	151	59	96	75
Total Kill	50	44	33	24	19	9	23	9
Total User Days	609	574	1,017	508	445	291	480	241

Source: Personnel Communication P. Page and D. Cross Department of Mines,
Natural Resources and Environment

^uUnknown

Appendix J

Table 5

Estimated Man-Days of Hunting and Deer Kills Per Hunter in the Mid-North Planning Area

	1971-72	1972-73	1973-74 ¹	1977-78 ²
Man-Days Hunting (Mid North)	3,975	4,223	5,422	--
Man-Days Hunting (Manitoba)	184,469	179,529	177,782	115,828
Deer Kills/Hunter Day (Mid North)	.04	.02	.002	--
Deer Kills/Hunter Day (Manitoba)	.13	.11	.08	.20
Deer Hunters (Mid North)	956	1,077	782	--
Deer Hunters (Manitoba)	39,082	50,559	55,659	37,364

¹Areas 1, 2, 3, 3A, 4, 9, 10 Closed

²No deer season in Mid-North 1974-75 to 1977-78

Appendix J

Table 6

Estimated^b Moose Hunting Pressure
(User-Days)

Game Hunting Area	1968		1969		1970		1971		1972		1973	
	R	NR	R	NR	R	NR	R	NR	R	NR	R	NR
1	1,904	0	914	0	717	36	1,409	72	2,293	0	2,782	46
1A												
2	125	56	363	226	128	426	348	435	970	713	1,436	1,103
2A												
3	195	153	334	154	576	26	915	237	970	371	517	125
3A											821	638
4	681	46	305	105	256	120	1,409	143	1,426	479	1,748	410
5	717	240	769	886	755	156	1,519	968	1,558	1,020	274	547
6	445	316	551	787	550	660	897	913	1,367	479	1,277	507
6A	500	71	580	83	563	57	860	151	1,147	120	631	34
7	1,710	597	1,291	561	2,714	510	3,880	646	3,175	2,132	3,329	1,585
8	1,279	1,076	682	1,601	1,165	1,591	1,126	1,991	1,771	1,331	4,986	1,436
9	3,114	255	3,770	308	1,690	156	2,946	94	3,851	433	3,238	695
10	250	357	638	451	653	759	1,116	1,018	897	1,368	2,136	1,072
11	653	117	653	193	947	270	878	580	1,205	17	2,105	428
12	1,807	56	986	28	870	208	1,464	787	1,470	724	942	428
15A	167	71	87	143	218	94	384	358	456	399	426	0
Sub Total ^a	13,247	3,412	11,919	5,522	11,802	5,070	19,151	8,390	22,557	9,585	26,646	9,055
Alternate ^c Estimate	11,221	3,672	12,079	5,584	12,186	4,980	15,818	8,265	26,772	13,555	22,692	12,043
Mean of Two Methods	12,234	3,542	11,999	5,553	11,994	5,025	17,485	8,328	24,665	11,570	24,669	10,549
Annual Total	15,776		17,552		17,019		25,813		36,235		35,218	

Game Hunting Area	1974		1975		1976		1977		Mean R		Average	
	R	NR	R	NR	R	NR	R	NR	R	NR		
1	940	0	162	0	102	3	491	19	1,171	16	1,187	
1A	*	0	1,494	0	978	0	2,948	0	1,807	0	1,807	
2	14,671	0	231	0	175	0	567	44	483	11	494	
2A	*	329	380	116	394	373	208	250	327	267	594	
3	***	0	391	0	350	50	302	82	506	120	626	
3A	*	0	1,086	0	380	0	1,021	4	827	128	955	
4	*	0	620	118	336	93	1,247	59	892	157	1,049	
5	0	171	0	0	657	0	851	0	756	399	1,155	
6	2,833	0	508	0	365	0	1,011	0	775	366	1,141	
6A	2,207	0	89	0	58	0	208	0	515	52	567	
7	*	188	2,539	99	2,994	203	2,892	225	2,725	675	3,400	
8	A	0	1,196	38	365	12	586	0	1,462	908	2,370	
9	*	0	3,134	0	2,044	75	8,051	74	3,538	210	3,748	
10	*	447	2,475	154	1,752	204	2,930	174	1,427	600	2,027	
11	**	0	629	0	803	0	775	0	961	161	1,122	
12	**	0	1,301	0	2,176	0	2,098	0	1,457	223	1,680	
15A	0	0	125	0	350	0	189	15	240	108	348	
Sub Total ^a	20,652	1,144	16,359	524	14,279	640	26,375	945	18,299	4,429	22,728	
Alternate ^c Estimate	23,090	1,170	14,272	558	16,160	1,102	29,730	976	18,402	5,191	23,593	
Mean of Two Methods	21,871	1,157	15,316	541	15,220	871	28,053	961	18,351	4,810		
Annual Total	23,028		15,857		16,091		29,014				23,161	

^aColumns may not equal totals due to rounding^bFrom hunter surveys: Personal Communication P. Page^cEstimated hunters times average days per hunter

A included in 6

R Resident

NR Non-Resident

* included in 2

** included in 6A

*** included in 1

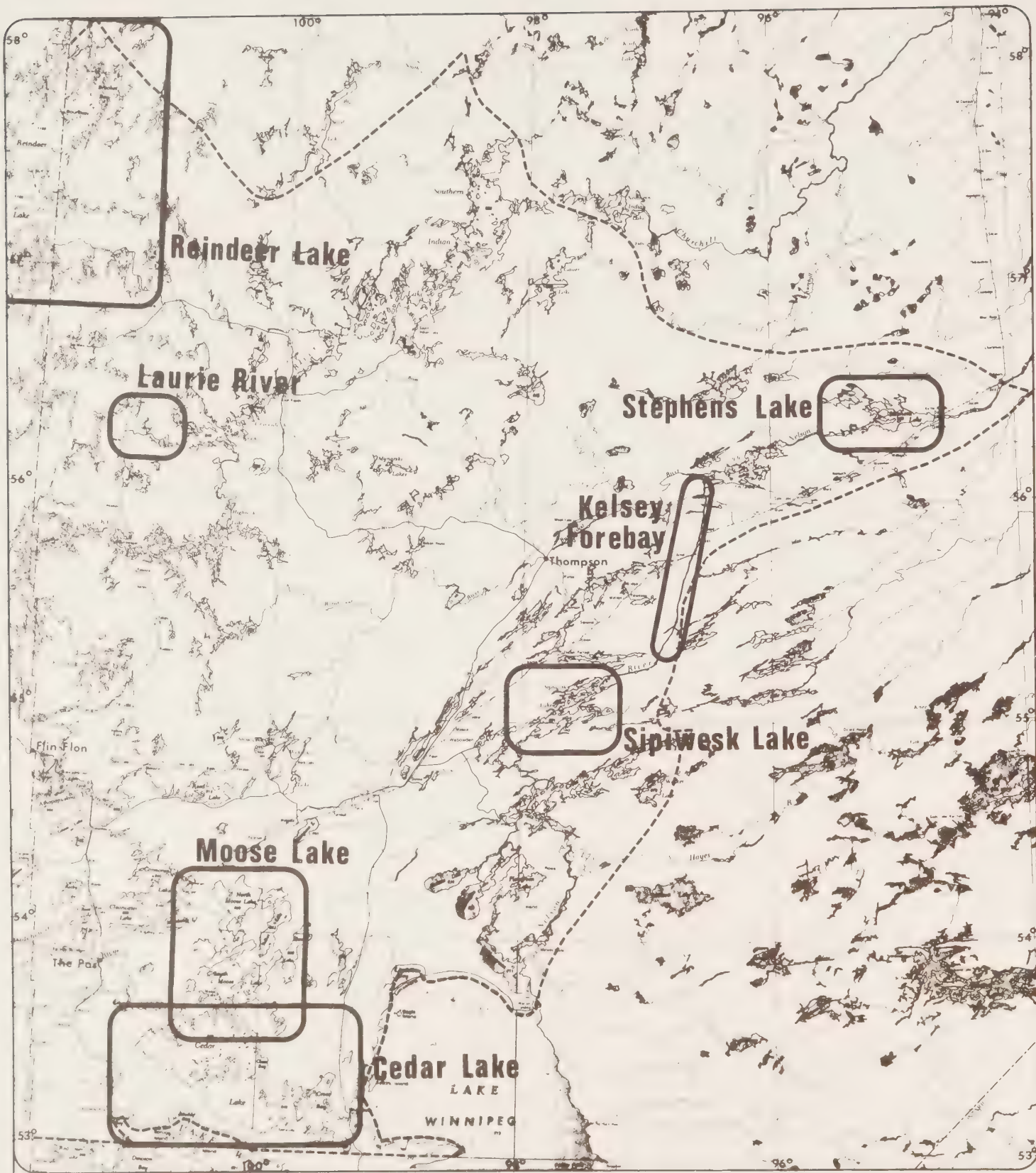
Appendix K

Existing Impoundments (characteristics and impact processes)

Laurie River Impoundment: This reservoir, located on the Laurie River south of Lynn Lake, has been in operation since 1950. The annual maximum drawdown is two to three feet. The zone of disturbance is detectable at a sediment depth of 8-10 cm. There are no obvious indications of intense shoreline erosion. Fluctuations in values of species diversity indicated that diatom phytoplankton populations in the reservoir were still (1970) responding to environmental change caused by impoundment 20 years ago, and have not yet attained a steady state condition.

Reindeer Lake: This large storage reservoir (controlled in Saskatchewan) has been in operation since 1938. Water levels have been raised about five feet over pre-impoundment levels. Total area flooded was approximately ten square miles. It has an annual mean drawdown of about two feet. The zone of disturbance is located at a sediment depth of 4-6 cm., indicating a sedimentation rate of approximately $1.7 \pm .5$ mm./year. This rate is similar to that calculated for natural lakes. Overall effects of impoundment on the diatom community composition has been small, indicating that impoundment has not appreciably disturbed this large lake. Transparency is high, the lake is strongly stratified in summer and levels of oxygen are invariably high.

Cedar Lake: This is a large reservoir on the lower reaches of the Saskatchewan River. Flooding commenced in 1964 and caused a rise of 12 feet in Cedar Lake and seven feet in adjoining Moose Lake. Mean annual drawdown is eight feet with a maximum drawdown of ten feet. Physical and chemical conditions in the lake have not altered appreciably. Oxygen levels, at least in the summer, remain high and there is little evidence of thermal stratification. The catch of northern pike has increased substantially since impoundment. This same increase was observed for goldeye until 1967 when production declined to a point below pre-impoundment levels. The total area flooded was between 800 and 900 square miles. Severe impact is noted regarding vegetation (slowly readjusting) although shore-



LOCATIONS OF EXISTING IMPOUNDMENTS

**MAP
APPENDIX K**

**MID NORTH
PLANNING ZONE**



line erosion is not serious. Some flooding has occurred outside of the dyked areas due to the natural porosity of the underlying limestone.

Sipiwesk Lake: The flooding of the shoreline of Sipiwesk occurred in 1960 as pondage for the Kelsey generating station. Lake level was increased by 7.5 feet with a mean annual level fluctuation of 4.8 feet. Approximately ten square miles of land was flooded in total, distributed over the lakes 1100 miles shoreline. The immediate results of flooding was the destruction of shoreline vegetation to a height equal to the maximum water level and the increase in shoreline erosion which resulted in higher nearshore turbidity. Five percent of Sipiwesk's shoreline (steep rock outcrop areas) experienced no impact due to flooding, ten percent of the shoreline received slight impact resulting in a narrow band of dead trees. Moderate impact resulted on 35 percent of the shoreline and was characterized by dead vegetation and erosion. The remaining 50 percent of the shoreline experienced severe impact with heavy erosion and intensive inland flooding.

Kelsey forebay (Nelson channel): The Nelson channel above Kelsey dam was also flooded in 1960 with a mean increase in water level of 53 feet. Total area flooded was approximately five square miles which was distributed over 150 miles of shoreline. The shorelines readjustment has resulted in; solifluction of unconsolidated till in some areas, severe bank undercutting near the upper end of the channel, shoreline vegetation killed to the maximum water level and remaining in place (except in areas of slumping or severe erosion), and increased erosion with resultant higher turbidities. Twenty percent of the shoreline received slight impact, resulting in dead vegetation only. Impact of a moderate extent was experienced by 40 percent of the shoreline consisting of dead vegetation and some erosion. Forty percent of the shoreline suffered severe impact characterized by dead vegetation, erosion, undercutting and solifluction.

Stephens Lake: Stephens Lake or the Kettle forebay was formed due to flooding resulting from the construction of the Kettle Rapids Dam.

Water level was raised in two stages (fall of 1970 and fall of 1971) to a maximum of 98 feet at the dam-site to a minimum of 43 feet at the base of Gull Rapids. Mean annual level fluctuation is approximately five feet. The approximate area flooded is 125 square miles with a mean inland extent of 1000 yards. The process of shoreline re-adjustment has resulted in; undercutting of high till banks, extensive permafrost melt (resulting in surface instability and slumping), large areas of flooded (standing) vegetation with floating peat islands in embayments and severe erosion of overburden banks and midstream islands. The level of impact on the shoreline of Stephens Lake appears to be either severe (95 percent) or non-existent (due to bedrock at the surface). Severely impacted areas are characterized by flooded vegetation, severe erosion and solifluction.

Appendix L

Master Angler Awards

The Manitoba Master Angler Award Program has been in operation since 1958. From this time to 1977 more than 23,000 awards have been issued provincially. The accompanying tables provide the detailed information on Mid North Awards.

Table 1
Master Angler Awards^a

Year	Total Awards	Number of Lakes	Average/ Lake
1977	644	71	9.1
1976	478	65	7.4
1975	619	71	8.7
1974	381	57	6.7
1973	429	52	8.3
1972	458	51	9.0
1971	352	53	6.6
1970	375	51	7.4
1969	396	43	9.2
1968	350	36	9.7
1967	209	34	6.1
1966	202	35	5.8
Mean	408	52	7.8

Source: Master Angler Award Winners
1966-1977

^aAwards issued for fish caught in the
Mid North Planning Zone.

Appendix L

Table 2

Zone Master Angler Awards by Species
Mid North Planning Zone

	Lake Trout No./% total	Northern Pike No./% total	Pickereel No./% total	Others No./% total	All Species No./% total
1977	49/47.1	453/53.0	33/ 6.1	118/ 7.1	644/20.3
1976	48/48.5	318/45.2	35/ 9.6	82/ 8.0	478/22.0
1975	73/67.0	338/46.4	33/ 7.8	175/18.9	619/28.3
1974	62/60.2	240/40.9	30/10.1	51/ 7.8	381/23.1
1973	54/59.3	268/38.6	20/ 7.4	90/12.6	429/24.4
1972	43/67.2	317/44.8	31/ 4.6	88/12.9	458/28.7
1971	29/39.2	263/56.2	19/10.3	41/ 6.5	352/26.0
1970	42/55.3	264/47.5	20/12.6	50/ 8.8	375/29.9
1969	31/54.3	318/59.3	7/ 6.0	40/ 7.2	396/31.3
1968	37/54.4	264/55.9	20/18.9	29/ 5.6	350/32.0
1967	36/55.4	154/45.6	8/ 6.8	11/ 2.5	209/21.8
1966	33/49.3	159/52.6	5/ 6.0	5/ 6.0	202/25.3
Mean	45/55.1	280/48.8	22/ 9.7	65/ 8.3	408/26.1

Appendix L

Table 3

Resident Award Winners by Community^a

Community	1977	1976	1975	1974	1973	Mean
Thompson	65	25	107	26	40	52.6
The Pas	62	40	40	41	34	43.4
Flin Flon	8	19	15	16	29	17.4
Gillam	17	4	14	7	4	9.2
Lynn Lake	8	10	13	1	7	7.8
Cranberry Portage	18	12	7	8	7	10.4
Snow Lake	6	5	4	8	3	5.2
Wanless	8	1	1	0	2	2.4
Grand Rapids	6	4	18	0	0	5.6
Jenpeg	11	8	4	0	0	4.6
Leaf Rapids	3	5	1	0	3	2.4
Others	3	3	6	2	5	3.8
Total	215	136	237	109	136	166.6
% of total awards	6.7	6.2	10.8	6.7	7.8	7.6
% of zone awards	32.9	28.2	38.3	28.5	31.5	32.4

^aResidents of the Planning Zone awarded Master Angler Awards from lakes in the Planning Zone.

Appendix L

Table 4

Master Angler Awards^a

Name	1970	1971	1972	1973	1974	1975	1976	1977	Mean	Location Twp.	Rge.
Reed Lake	29	52	43	76	46	51	56	87	55.0	65	20W
Churchill River ^b	18	6	16	37	29	130	80	60	46.4	77-112	
Athapapuskow Lake	39	40	48	39	45	34	40	50	41.9	64	28W
Cedar Lake ^c	43	6	26	16	14	38	13	42	24.8	51	19W
Kississing Lake	18	4	7	22	45	26	29	45	24.5	71	26W
Rocky Lake	9	12	24	30	20	28	23	26	21.5	60	27W
Clearwater Lake	21	8	15	15	20	26	19	20	18.0	58	25W
Cross Lake ^d	31	23	29	17	6	9	14	15	17.9	66	2W
Cormorant Lake	34	24	21	17	14	12	8	11	17.6	60	23W
3rd Cranberry Lake	16	42	51	7	3	2	1	4	15.8	66	23W
Minago River	0	0	1	28	8	33	16	5	11.4	59-64	5-14W
Saskatchewan River	5	10	20	14	8	12	13	5	10.9	48-58	13-29W
Scotty Lake	6	6	29	7	2	6	7	6	8.6	66	26W
Waskaiowaka Lake	3	16	24	13	3	0	0	0	7.4	87	7E
McGavock Lake	2	0	7	3	9	4	17	12	6.8	87	26W
Grass River	9	3	8	9	5	9	2	6	6.4	65-80	4E-25W
Odei River	0	0	0	0	0	0	0	51	6.4	79-83	5E- 6W
Nelson River ^b	0	1	4	4	2	9	3	26	6.1	57-92	9E- 4W
Eden Lake	2	2	0	1	0	6	6	30	5.9	88	18W
Simonhouse Lake	4	3	7	2	8	5	5	12	5.8	64	25W
2nd Cranberry Lake	9	5	6	6	3	4	7	2	5.3	65	25W
1st Cranberry Lake	10	6	2	4	5	6	6	1	5.0	65	26W
File Lake	0	5	9	6	3	6	6	4	4.9	68	19W
Carrot River	1	2	4	5	5	6	11	2	4.5	55	27-29W
Tramping Lake	8	7	5	1	6	4	3	0	4.3	65	18W
Ospwagan Lake	0	0	0	0	1	32	0	0	4.1	76	4W
Upper Ospwagan Lake	0	0	0	0	0	26	5	1	4.0	75	5W
Morton Lake	0	0	7	7	3	5	3	4	3.6	67	20W
Granville Lake	0	0	0	0	0	5	8	14	3.4	84	20W
Vandekerckhove Lake	2	9	1	2	1	4	4	3	3.3	92	25W
Newman Lake	12	1	1	1	1	5	1	2	3.0	64	28W
Iskwasum Lake	4	1	3	3	3	2	4	1	2.6	65	23W
Neso Lake	1	15	1	1	0	0	1	1	2.5	65	27W
Loucks Lake	0	3	4	2	6	4	0	0	2.4	65	22W
Burntwood River	0	4	0	1	2	3	0	9	2.4	74-82	5E-18W
Limestone River	0	0	0	0	3	5	3	7	2.3	86-88	11E-21E
Schist Lake	2	1	4	2	0	1	4	4	2.3	65	29W
Woosey Lake	0	0	0	1	4	5	1	1	1.9	67	19W
Wabishkok Lake	1	1	4	0	0	3	3	2	1.8	68	27W
Alberts Lake	1	3	1	1	3	0	2	3	1.8	67	27W
Kisseynew Lake	1	4	3	0	0	1	1	2	1.5	69	28W
Sky Pilot Creek	3	0	0	0	2	0	1	6	1.5	85-86	17-20E
Wekusko Lake	0	0	2	3	3	1	0	1	1.3	67	16W
Cockeram Lake	0	0	0	0	0	2	6	2	1.3	90	22W
Barrington River	0	1	0	0	0	2	4	3	1.3	89-90	15-17W
Cochrane River	0	6	0	0	0	0	3	0	1.1	103-116	23-27W
Goose Lake	0	0	0	0	8	0	1	0	1.1	63	27W
Apussigamasi Lake	1	2	0	0	2	2	2	0	1.1	80	1W
McMillan Lake	3	1	2	0	0	1	1	0	1.1	92	27W
Payuk Lake	4	0	1	0	2	0	0	1	1.0	65	27W
Orr Creek	0	0	0	0	0	0	0	8	1.0	81	2E
Velde Lake	0	0	0	1	3	2	1	1	1.0	74	5W
. continued											

^a Certain lakes and rivers have not been included due to difficulties in determining locations or where several water bodies have the same name (e.g., Moose Lake).

^b May contain some awards for fish taken outside the Planning Zone.

^c Figures listed may be higher due to a naming confusion with Cross Bay and Cross Lake.

^d Numbers are probably high, particularly 1970-1972 due to confusion with Cross Bay.

Table 4 continued

Name	1970	1971	1972	1973	1974	1975	1976	1977	Mean	Location	
										Twp.	Rge
Paint Lake	0	0	0	0	3	1	1	2	0.9	75	4W
Peak Lake	0	0	0	2	5	0	0	0	0.9	79	1W
Trout Lake	0	1	0	0	0	0	6	0	0.9	102	8W
Muddy Lake	0	1	0	1	2	0	0	2	0.8	70	21W
Nome Lake	0	1	0	2	0	0	3	0	0.8	61	29W
Wookey Creek	0	0	0	0	0	0	0	6	0.8	66	19W
Frog Creek	3	1	0	0	1	0	0	1	0.8	60	20W
Claw Lake	0	1	2	1	0	1	0	1	0.8	67	22W
Hughes River	0	0	1	0	0	3	0	1	0.6	91	21W
Moses Lake	0	0	0	2	0	1	1	2	0.6	90	21W
Sipiwek Lake	0	0	0	0	1	0	3	1	0.6	69	3W
Squall Lake	1	0	0	0	1	2	1	0	0.6	69	18W
Sickle Lake	0	0	0	0	0	0	0	5	0.6	88	21W
Webb Lake	0	0	0	0	0	0	1	4	0.6	69	23W
Hale Lake	3	1	0	0	1	0	0	0	0.6	88	9E
Highrock Lake	0	0	0	0	1	3	0	0	0.5	79	20W
Hughes Lake	1	0	0	0	0	3	0	0	0.5	90	20W
Berge Lake	1	0	1	2	0	0	0	0	0.5	91	23W
Setting Lake	0	0	0	0	0	2	2	0	0.5	69	8W
Pasquia River	1	0	0	0	1	1	0	1	0.5	53-55	26-27W
Moodie Lake	0	0	0	0	0	4	0	0	0.5	70	22W
Amulet Lake	0	0	1	3	0	0	0	0	0.5	67	27W
Aimee Lake	0	0	0	2	1	0	0	0	0.4	68	27W
Tod Lake	0	0	0	1	0	2	0	0	0.4	87	28W
Motriuk Lake	1	0	1	0	0	1	0	0	0.4	90	24W
Stephens Lake	0	0	0	0	0	2	1	0	0.4	85	16E
Manistikwan Lake	0	1	0	2	0	0	0	0	0.4	66	29W
Mistik Creek	1	0	0	0	1	1	0	0	0.4	65	28W
Anson Lake	0	0	0	0	0	1	2	0	0.4	89	21W
Southern Indian Lake	0	0	0	0	0	1	2	0	0.4	95	6W
Squall Creek	0	1	1	0	0	1	0	0	0.4	68	18W
Phillips Lake	0	0	0	0	0	1	0	2	0.4	72	6W
Joey Lake	0	0	2	0	1	0	0	0	0.4	74	5W
Little Cormorant Lake	0	1	0	1	0	0	0	1	0.4	60	21W
Krug Lake	1	1	1	0	0	0	0	0	0.4	66	21W
Embury Lake	1	0	0	0	0	1	0	0	0.3	67	29W
Fiskitto Lake	0	0	0	2	0	0	0	0	0.3	61	8W
Mystery Lake	0	1	0	1	0	0	0	0	0.3	79	2W
Yanlingstone Lake	1	0	0	0	1	0	0	0	0.3	62	23W
South Oshwagan Lake	0	0	0	0	0	2	0	0	0.3	75	5W
Mitchell Lake	0	0	0	0	0	1	1	0	0.3	62	24W
Neosap Lake	0	0	1	0	0	0	1	0	0.3	68	26W
Little Brightsand Lake	0	0	0	0	1	0	0	1	0.3	91	24W
McLeod Lake	0	0	0	0	1	0	0	0	0.3	69	17W
Wiskimin Lake	0	0	0	0	0	0	1	0	0.3	70	4E
Mc Lake	0	0	0	0	0	0	2	0	0.3	63	20W
Limestone Lake	0	0	1	0	0	0	0	0	0.3	87	10E
Waggon Lake	0	0	0	0	0	0	0	2	0.3	82	18W
Atik Lake	0	0	0	0	0	0	0	2	0.3	60	27W
Waggon Lake	0	0	0	0	0	1	1	0	0.3	83	14E
Conterland Lake	0	0	2	0	0	0	0	0	0.3	66	29W

Table 4 continued

Name	1970	1971	1972	1973	1974	1975	1976	1977	Mean	Location	
										Twp.	Rge
Amy Lake	1	1	0	0	0	0	0	0	0.3	87	22W
Armstrong Lake	2	0	0	0	0	0	0	0	0.3	77	4E
Morgan Lake	2	0	0	0	0	0	0	0	0.3	67	19W
Mid Lake	0	0	0	0	0	0	0	2	0.3	75	5W
Pasquia Lake	1	0	0	0	0	0	0	0	0.1	54	27W
Laurie River	0	0	0	0	0	1	0	0	0.1	83	23W
Fish Lake	0	0	0	0	0	1	0	0	0.1	69	9W
Guthrie Lake	0	0	1	0	0	0	0	0	0.1	72	21W
Bonald Lake	0	0	0	1	0	0	0	0	0.1	78	26W
Saskram River	0	0	0	1	0	0	0	0	0.1	56	27W
Batty Lake	0	0	0	0	0	1	0	0	0.1	71	21W
Zed Lake	0	0	0	0	0	0	1	0	0.1	91	24W
Pothier Lake	0	0	0	0	0	0	1	0	0.1	63	25W
Drunken Lake	0	0	0	0	0	0	1	0	0.1	64	7W
Snow Lake	0	0	0	0	0	0	1	0	0.1	68	17W
Sundance River	0	0	0	0	0	0	0	1	0.1	87	22E
Kormans Lake	0	0	0	0	0	0	0	1	0.1	67	17W
Dolomite Lake	0	0	0	0	0	0	0	1	0.1	63	21W
Split Lake	0	0	0	0	0	0	0	1	0.1	83	9E
Riddoch Lake	0	0	0	0	0	0	0	1	0.1	74	1E
Stag Lake	0	0	0	0	0	0	1	0	0.1	86	19W
Weir River	0	0	0	0	0	1	0	0	0.1	90	21E
Germell Lake	0	0	0	0	0	1	0	0	0.1	89	24W
Reader Lake	0	0	0	0	0	1	0	0	0.1	57	27W
Machewin Lake	0	0	0	0	1	0	0	0	0.1	81	10W
Pelletier Lake	0	0	0	0	1	0	0	0	0.1	86	4E
Oblong Lake	0	0	0	1	0	0	0	0	0.1	68	29W
Soab Creek	1	0	0	0	0	0	0	0	0.1	72	6W
Cook Lake	0	0	1	0	0	0	0	0	0.1	68 76	18W or 2E
Taylor River	0	0	1	0	0	0	0	0	0.1	75	5W
Kississing River	0	0	1	0	0	0	0	0	0.1	73	24W
Ostaskawetawin Lake	0	1	0	0	0	0	0	0	0.1	66	25W
Nisto Lake	0	1	0	0	0	0	0	0	0.1	66	27W
Dodds Lake	0	1	0	0	0	0	0	0	0.1	65	27W
Loon Lake	0	1	0	0	0	0	0	0	0.1	103	7W
Clark Lake	0	1	0	0	0	0	0	0	0.1	84	10E
Wedge Lake	1	0	0	0	0	0	0	0	0.1	65	24W
Mikanapan Lake	1	0	0	0	0	0	0	0	0.1	67	28W
Crow Lake	0	0	0	0	1	0	0	0	0.1	73	26W
Ralph Lake	0	0	0	0	0	0	0	1	0.1	91	23W
Footprint Lake	0	0	0	0	0	0	0	1	0.1	78	10W

Appendix M

Table 1

Travel Expenditures in Manitoba

Year	(millions of dollars)		
	Resident ^a	Others	Total
1971	164.6	78.0	242.6
1972	177.0	88.1	265.1
1973	188.3	97.0	285.2
1974	194.5	101.2	295.6
1975	206.1	105.9	312.0
1976	218.5	112.9	331.4
1977	218.5	114.2	332.7

^aA portion of this spending is on 'trip preparation' including for trips outside Manitoba

SOURCE: Personal communication Neil Nixon

Appendix M

Table 2

Manitoba Balance of Travel Payments (Millions of Dollars)

<u>CANADA</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Receipts	32.8	35.3	41.6	48.0	45.2	48.3	51.2
Expenditures	24.3	26.1	30.8	36.3	41.2	43.6	47.8
Balance of Payments	+8.5	+9.2	+10.8	+11.7	+4.0	+4.7	+3.4
 <u>UNITED STATES</u>	 <u>1971</u>	 <u>1972</u>	 <u>1973</u>	 <u>1974</u>	 <u>1975</u>	 <u>1976</u>	 <u>1977</u>
Receipts	47.6	55.4	58.4	49.2	55.5	57.9	56.5
Expenditures	38.7	48.7	38.5	40.0	58.2	82.0	95.9
Balance of Payments	+8.9	+6.7	+19.9	+9.2	-2.7	-24.1	-39.4
 <u>OVERSEAS</u>	 <u>1971</u>	 <u>1972</u>	 <u>1973</u>	 <u>1974</u>	 <u>1975</u>	 <u>1976</u>	 <u>1977</u>
Receipts	2.5	2.5	3.5	4.0	5.2	6.7	6.6
Expenditures	15.0	15.0	15.4	20.8	24.4	25.3	32.5
Balance of Payments	-12.5	-12.5	-11.9	-16.8	-19.2	-18.6	-25.9
 <u>TOTAL</u>	 <u>1971</u>	 <u>1972</u>	 <u>1973</u>	 <u>1974</u>	 <u>1975</u>	 <u>1976</u>	 <u>1977</u>
Receipts	82.9	93.2	103.5	101.2	107.6	112.6	114.3
Expenditures	78.0	89.8	84.7	97.1	123.8	150.9	176.2
Balance of Payments	+ 4.9	+3.4	+18.8	+4.1	-16.2	-38.0	-61.9

Source: Personal Communication Neil Nixon

Appendix M

Table 3

Origin of Cottage Owners and Leasees

	# Local ^a	# Other Manitoba	# Other Canada	# U.S.	Unknown
Aimee	1	0	0	2	0
Athapaskow	263	23	9	9	0
Clearwater	294 ^b	38	17	5	0
Berge	34	2	0	1	0
Cross Bay	11	2	0	0	0
Eden	2	0	0	0	0
1st Cranberry	9	1	0	0	0
Hughes	2	0	0	0	0
Manistikwan	123	2	3	0	0
Paint	126	3	1	0	0
Payuk	5	0	0	1	0
Rocky	75	0	0	0	0
Schist	19	2	1	0	0
Setting	128	2	2	0	11
Wekusko	33	2	0	0	0
Zed	27	0	0	0	0
Total	1152	77	33	18	11

Source: Personnel Communication, Parks Branch, Northern
Region November, 1978

^aLess than 75 driving miles from site

^bIncludes 72 private lots

Appendix M

Table 4

PARTICIPATION IN SELECTED SPORTS ACTIVITIES BY SEX, PERSONS 14 YEARS OF AGE AND OVER, 1971-72.

<u>Activity</u>	<u>(% of population)</u>	
	<u>Canada</u>	<u>Manitoba</u>
GOLF - M	11.4	12.7
F	3.7	3.7
Total	7.5	8.1
TENNIS - M	5.5	4.5
F	4.5	3.1
Total	5.0	3.8
SKATING - M	16.9	16.2
F	12.5	9.9
Total	14.6	13.0
SKIING - M	7.6	2.8
F	6.0	2.1
Total	6.8	2.5
SNOWMOBILING - M	14.7	15.3
F	9.8	9.2
Total	12.2	12.1
SWIMMING - M	30.2	25.7
F	26.9	22.9
Total	28.5	24.3
WATERSKIING - M	6.6	6.6
F	3.9	2.8
Total	5.2	4.7
WALKING - M	37.9	39.0
F	45.8	45.9
Total	41.9	42.6
BICYCLING - M	11.9	14.2
F	11.8	13.6
Total	11.8	13.9
HUNTING/FISHING - M	30.8	33.0
F	8.8	8.0
Total	19.6	20.1

Source: Statistics Canada - 1975.

Appendix M

Table 5
PARTICIPATION AND FAVORITE SPORTS 1976

Sport	Ranks			
	By No. of Participants	By Preference of Participants	By No. of Participants	By Preference of Participants
	CANADA		MANITOBA	
Swimming	1	1	1	1
Skating	2	9	2	2
Tennis	3	6	3	6
Golf	4	3	4	5
Hockey	5	2	6	a
Cross-Country Skiing	6	7	7	a
Downhill Skiing	7	4	9	a
Curling	8	8	4	3
Bowling	9	5	8	4
Baseball	10	10	10	a

a Ranks cannot be assigned due to high variability in sampling

SOURCE: Statistics Canada, Catalogue 81-001 March, 1978

Table 6
Purpose of Vacation Trips

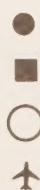
Main Purpose	(Percentage)						
	Canadians ^a				Manitobans ^b		
	67	68	69	70	69	70	73
Visit Friends or Relatives	45	47	47	47	57	64	51
Sightseeing in Cities/Towns	11	14	13	14	16	11	14
Sightseeing Away from Cities/Towns	9	17	12	15	6	13	20
Spend Time at Vacation Spot	19	25	22	27	7	14	20
Fishing, Boating	12	12	10	14	8	8	9
Camping, Tenting	8	12	9	9	4	3	14
Shopping	5	6	7	6	4	5	4
Cottage Stay	4	6	6	5	5	1	4
Festival or Special Event	3	4	5	6	3	9	6

Source: ^a The Canadian Tourism Fact Book 1972,
Canada Dept. of Industry, Trade and Commerce,
Ottawa, 1972.

^b A Report on Canadian Visitors to Manitoba and Manitobans
on Vacation 1973,
D. Wang, Manitoba Dept. of T.R.C.A., #156, Winnipeg, 1974.



LODGES AND OUTCAMPS (1976)
PRIVATE HUNTING AND FISHING CABINS
OUTCAMPS RELATED TO COMMERCIAL LODGES
COMMERCIAL LODGES
FLY-IN LODGES



MAP 1. APPENDIX M

MID NORTH
PLANNING ZONE

1 inch:40 miles

